NOTICE.

A Member of the Bombay Natural History Society, intending to travel to Europe next Spring through Baghdad and Damascus, wants to meet with another who would join him.—Apply to "OMEGA," care of Hon. Sec., B. N. H. Soc., 6, Apollo Street, Bombay.

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NESTING IN WESTERN INDIA.

(*Continued from page* 21.)

226.—THE VIOLET-EARED RED HONEYSUCKER.

Æthopyga vigorsi, Sykes.

This beautiful bird occurs all along the ghats, straying from there a little in the cold weather; it is very common at Khandalla, where it is a permanent resident, breeding during the latter part of the rains, making a hanging nest, a great deal larger than that of the Common Purple Honeysucker. Mr. Davidson says that in the only two cases in which nests came to his notice, they contained three eggs and three young respectively. The eggs resembled those of the Amethyst Honeysucker, but were considerably larger, and had a hair line round the larger end, such as is common in some of the Wagtails.

232.—THE AMETHYST HONEYSUCKER.

Cinnyris zeylonica, Lin.

This is the common Honeysucker of the Deccan, and is very abundant at and near Bombay. Mr. Davidson says that an immature specimen was named by Mr. Hume from a lot of *Cinnyris asiatica* sent by him from Khandesh, but that he personally never identified one from there, and that even in the Nassick district, he never noticed it further east than Nassick itself, and that similarly in Sholapur it did not come further east than Pandharpur.

It probably breeds twice or oftener during the year, as nests are found at all seasons, but September is perhaps the best month to search for them.

A capital description of the nest is given by Mr. Vidal, C.S., in his *Ratnagiri Birds*, published in the *Bombay Gazetteer* for 1880, which I cannot do better than reproduce :—

"Their nests are beautiful, hung from the slenderest twigs, and rocked to and fro by every breath of wind. The nest is pear-shaped, narrowing in the middle, with a side entrance shaded by a tiny overhanging porch. The materials are the finest grass lined with soft down, and the nests are on the outside prettily decorated with chips of wood, spider webs, dried flowers, cocoons, and anything else that pleases the fancy of the diminutive architects. They lay two, occasionally three, tiny greenish-white eggs, speckled with minute brown spots. The Jujube tree (*Zizyphus jujuba*) is a favourite place for the nest, but they are very fearless, often building in verandahs and house porches." Mr. Davidson observes that they very rarely lay three eggs ; I myself never found more than two.

The eggs measure 0·65 inches in length, by about 0·47 in breadth.

Dadur, &c., Bombay, August and September. *H. E. Barnes.*
South Konkan, Jan., March, April, September. *G. Vidal, C.S.*

233.—THE TINY HONEYSUCKER.

Cinnyris minima, Sykes.

The Tiny Honeysucker occurs on the Sahyadri range, extending as far north as Khandalla. It is not uncommon at Matheran. It is a permanent resident, breeding during September and October. The nest is pendant, of an oval shape, very similar to that of the Purple Honeysucker, but smaller. The eggs, two in number, are longish ovals in shape, and are of a greyish- or greenish-white colour, freckled and mottled with greyish and olive-brown ; the markings are generally thicker at the large end, forming a cap or zone. They measure 0·62 inches in length by about 0·42 in breadth.

I have never found a nest, and the eggs in my collection came from the Nilgiris, but Mr. Davidson found a nest containing a young one just hatched at Matheran in February, and remarks that the nest was made of green moss.

234.—THE PURPLE HONEYSUCKER.

Cinnyris asiatica, Lin.

This Honeysucker is generally distributed throughout Western India, but is much more common in the North, where, indeed, it is the only representative of the genus. They commence to breed early in March, and nests may be found quite up to the beginning of the rains. The nest is pendant, shaped something like a florence flask, or oval with a tapering neck. This is suspended from the tip of a slender branch or twig. All sorts of materials are made use of in constructing the nest: fibres, cobwebs, hair, fine grass, bits of straw, lichens, dead leaves, dried flower petals, pieces of rags, &c., are all used, and are neatly and compactly woven together. It is well lined with soft vegetable down. The nest at a short distance resembles one of the bunches of cobwebs, so commonly met with on trees and bushes.

The entrance, which is on one side, about half way up, is shaded by a canopy, beautifully adapted to keep out the rain. It is worthy of notice that in Sind, where the rainfall is scanty, this canopy is altogether absent, or only just indicated. The eggs, two or three in number, are dingy little ovals; the ground colour is greenish or greyish white, usually almost obscured by greyish-brown or greyish-purple ill-defined markings.

They average 0·64 inches in length, by about 0·46 in breadth.

The nests are too common to need detailed dates.

The nest is occasionally found in the centre of a large dusty cobweb; and would escape detection, were it not for the fussy habits of the parent birds.

235.—THE LARGE PURPLE HONEYSUCKER.

Cinnyris lotenia, Jerd.

Within our limits this is the least common of all our Honeysuckers. It appears to be restricted to the ghats and adjacent forests; it also occurs sparingly in the neighbourhood of Bombay, where Mr. E. H. Aitken found it breeding in his garden in November. Of this an account was given at p. 52, No. 1, Vol. II. of the *B. N. H. S. Journal.* He describes the nest as very similar to that of *Cinnyris zeylonica*, but much longer, measuring quite ten inches. Unfortunately he delayed taking the nest, which, on examination, was found to contain one young one and a much incubated egg,

This was of a dirty brownish-white ground colour, the smaller end being thickly covered with dull-brown spots which passed into larger confluent blotches and formed a cap at the larger end; he does not give the size of the eggs.

Oorun, Bombay, November. *E. H. Aitken, B.A.*

238.—TICKELL'S FLOWER-PECKER.

Dicæum erythrorhynchus, Lath.

This Flower-Pecker is not uncommon all along the Sahyadri range and in the forests adjacent; it occurs also at and near Baroda. It has not as yet been recorded from Abu, but doubtless occurs there, having probably been overlooked on account of its diminutive size, plain colours and arboreal habits. It is a permanent resident, breeding during March and April, making an egg-shaped nest composed of soft silky down and vegetable fibres, which is suspended by its smaller end to a twig; it is often well concealed by leaves. The eggs, two or three in number, are pure glossless white, of a narrow oval shape, measuring 0·64 inches in length by about 0·42 in breadth. Mr. Davidson says, that "this bird appears to me to be a western form; I only got it sparingly close to the extreme west of the district. In Nassick, due south of this, it was very common in the western talookas, but rare or absent in the east."

W. Nassick, February, March, and April. *J. Davidson, C. S.*
Khandalla, April. *H. E. Barnes.*
Baroda, *H. Littledale, Esq.*

239.—THE NILGIRI FLOWER-PECKER.

Dicæum concolor, Jerd.

Within our limits, this bird seems to be confined to the extreme south-east. It is probably a permanent resident.

240.—THE THICK-BILLED FLOWER-PECKER.

Piprisoma agile, Tick.

The Thick-billed Flower-Pecker has been recorded from Ratnagiri; it is rare in West Khandesh, but is common in all the western districts of Nassick, and therefore most probably occurs more or less commonly throughout the Sahyadri range. It crops up again at Baroda. Jerdon records it from the Deccan and the Malabar Coasts. They are, I believe, permanent residents wherever found, breeding during March and April, making a beautiful bag-shaped

nest, hung over a twig, at short distance from the end; the entrance hole is in front, at right angles to the twig, never in the side. The materials composing it are soft, fluffy vegetable down, spider webs, and flower petals, firmly felted together; it is very soft and pliable, and is of a dull uniform pinkish colour. I have never seen any other type than this, but my experience is not a very extensive one, being confined to Saugor, C. P., where the bird is common, and where I have taken many nests. The nest, although so neat and compact, does not take long to make. I watched a bird with a small piece of spider's web in its beak, and it stuck it above my head on a twig—in fact, I saw the foundation laid. The next day at about the same hour the nest was shaped, and on the fourth day the first egg was laid. The eggs, three in number, are longish ovals, measuring 0·63 inches in length by 0·4 in breadth; in colour they are rosy-pink, streaked, blotched, and speckled with claret and brownish-pink; the markings are usually much more numerous at the larger end. Occasionally the ground colour is white, but the markings are the same. Twice I have found a pure white egg in the nest, with two others of the usual colour.

Baroda, May. — *H. Littledale, Esq.*
Nassick, End of February, March, April. — *J. Davidson, C.S.*
Saugor, C.P., 18th Feb. to 10th May. — *H. E. Barnes.*

253.—THE VELVET-FRONTED NUTHATCH.

Dendrophila frontalis, Horsf.

This beautiful Nuthatch occurs in the most southern portion of the district, where it is very rare. Mr. Davidson says that it is not uncommon in the Dangs and broken country west of the ridge of the ghats in Nassick. I can find no record of any eggs having been taken within our limits; the eggs in my collection were taken on the Shevaroy hills, still further south.

They are broadish ovals in shape, measuring 0·67 inches in length by about 0·55 in breadth, and are white speckled and blotched with rusty red.

Shevaroy Hills, March. — *W. M. Daly, Esq.*

255.—THE INDIAN HOOPOE.

Upupa ceylonensis, Reich.

The Indian Hoopoe is a common permanent resident in the Deccan and southern portion of the district generally, becoming much

less common further north, where it occurs only as a visitant: it has not as yet been recorded from Sind. It breeds during March, April, and May in holes in trees, in banks and in walls, making little or no nest; the eggs, from five to seven in number, are rather narrow ovals pointed at one end, measuring 0·97 inches in length by 0·66 in breadth; they are pale greyish blue when fresh, but become darker and dingier as incubation proceeds. The beaks of the nestlings when first hatched are short, and it is interesting and amusing to watch the rapid growth.

A specimen shot by me at Saugor has a bill 3·46 inches long at the gape, or about an inch longer than usual.

Poona, March.	*H. E. Barnes.*
Sholapur, April and May.	*J. Davidson, C.S.*

256.—THE INDIAN GREY SHRIKE.

Lanius lahtora, Sykes.

The Grey Shrike is a common permanent resident throughout the greater portion of Western India; it is less common in the south-west, and appears to be altogether absent from Ratnagiri. It breeds from February to July, making a deep-cup shaped nest in a fork in a small tree or bush, generally a thorny one. The materials composing it are various, almost anything and everything being made use of. The eggs, usually four in number, occasionally five or six, are broadish ovals, pointed at one end, measuring 1·03 inches in length by 0·79 in breadth; the ground colour is a very pale greenish-white (sometimes pale stone), spotted and blotched with different shades of brown and purple; the markings are often most numerous at the larger end, forming an irregular cap or zone.

Sholapur, Nassick, Khandesh,	*Feb. to March, and June and July.*	*J. Davidson, C.S.*
Deesa, Neemuch, &c.,	*Feb. to July.*	*H. E. Barnes.*
Hydrabad, Sind,	*March to May.*	,,
Baroda,	*April to July.*	*H. Littledale, Esq.*

257.—THE RUFOUS-BACKED SHRIKE.

Lanius erythronotus, Vig.

The Rufous-backed Shrike is a common permanent resident throughout the greater portion of the district, breeding from March

to August, or even earlier. The nest is very similar to that of the Grey Shrike, but is smaller; the eggs, five or six in number, are broad ovals in shape, pinched in at one end; they average 0·92 inches in length by 0·7 in breadth; the ground colour is a very pale pinkish stone, but is subject to much variation. They are spotted and blotched with purplish and pale-brown. Mr Davidson informs me that this bird does not breed in the Sholapur district, though it is a common breeder in Satara, Nassick, and Khandesh.

Hyderabad, Sind, May to July. — *H. E. Barnes.*
Neemuch, &c., &c., June to Aug. — ,,
Baroda, May to July. — *H. Littledale, Esq.*

260.—THE BAY-BACKED SHRIKE.

Lanius vittatus, Val.

The Bay-backed Shrike is a very common permanent resident throughout the greater portion of the district, but like the last is much less common in the south. They breed from May to August, making a neat, compact, cup-shaped nest composed of grass stems, roots, &c.; it is usually placed in a fork in a small tree, but occasionally at the junction of a large branch with the trunk. The eggs, four in number, sometimes five or six, are broad ovals, pinched in at one end, and average 0·83 inches in length by 0·65 in breadth.

The ground colour is pale brownish-stone, or pale-creamy, feebly speckled and spotted with brown and purple. The markings occasionally form a ring round the larger end.

Poona, May to July. — *H. E. Barnes.*
Hyderabad, Sind, June to Aug. — ,,
Neemuch, March to July. — ,,
Nassick and Khandesh, March to July. — *J. Davidson, C.S.*
Baroda, March to June. — *H. Littledale, Esq.*

265.—THE COMMON WOOD SHRIKE.

Tephrodornis pondicerianus, Gmel.

The Common Wood Shrike is very abundant in all suitable localities in the district; it is a permanent resident, breeding from the latter end of February to May, making a compact cup-shaped nest, composed of grass roots and fibres bound together with spider webs; it is placed in a fork in a tree; occasionally in a bush. The eggs, three in number, rarely four, are broadish ovals in shape,

measuring 0·75 inches in length by 0·6 in breadth. In colour they are greenish-white or creamy-stone, thickly spotted and blotched with yellowish- and reddish-brown, with occasional underlying patches of pale inky purple; the markings are usually more numerous at the larger end.

Hyderabad, Sind, April.	*H. E Barnes.*
Konkan, February.	*G. Vidal, C.S.*
Nassick, March and April.	*J. Davidson, C.S.*
Khandesh, ,,	,,
Baroda, March.	*H. Littledale, Esq.*

267.—THE LITTLE PIED SHRIKE.

Hemipus picatus, Sykes.

The Little Pied Shrike is rare, and is apparently confined to the Sahyadri range. It has been recorded from Savantwadi, in the Southern, and Western Khandesh, in the northern parts of these hills.

Mr. Davidson writes as follows:—"This little Shrike is not uncommon in the Satpooras (Khandesh), but is, in my experience, rare in the ghats. I took a nest just nnder the crest of the ghâts, in West Nassick, on the 25th May 1887. The nest was on the upper side of a horizontal branch of a tall silk cotton tree, near the tip of the branch. It was a large pad of moss, bound round and to the branch with spider webs, and was lined with fine grass. It is the shallowest nest I have ever seen. The eggs were miniatnres of those of the Common Wood Shrike."

268.—THE BLACK-HEADED CUCKOO SHRIKE.

The Black-headed Cuckoo Shrike is absent altogether from Sind, and is very rare at Abu, but becomes more common further south. It is a permanent resident, but wanders about a good deal during the cold season. It breeds from June to August, making a shallow nest, composed of thin twigs and grass roots bound together with spider webs. The eggs, three or four in number, are longish ovals, pointed at one end, measuring 0·85 inches in length by 0·66 in breadth; they are pale-greenish white in colour, boldly marked with spots and streaks of brown.

Wassind, Bombay, July.	*H. E. Barnes.*
Baroda, June and July.	*H. Littledale, Esq.*
Dhulia, W. Khandesh, June and July.	*J. Davidson, C.S.*

270.—THE LARGE CUCKOO SHRIKE.

Graucalus macei, Less.

The Large Cuckoo Shrike is rare in the northern portion of the Presidency, but is more common towards the south. It breeds at various seasons in different parts of the country, and may perhaps have two broods in the year. The nest is placed high up in a thick fork, or on a horizontal branch in a lofty tree, and is of a shallow cup shape, composed of thin twigs, grass bents and moss, bound together with spider webs. The eggs, two or three (often only one) in number, are longish ovals, of a pale-greenish stone colour, streaked, spotted, and blotched with brown, with underlying clouds, of pale inky-purple. They average 1·22 inches in length by 0·9 in breadth.

S. Konkan, February and March.	*G. Vidal, C.S.*
Saugor, C. P., May to August.	*H. E. Barnes.*
Baroda, August to October.	*H. Littledale, Esq.*
Nassick, May.	*J. Davidson, C.S.*
Khandesh, August.	,,

272.—THE ORANGE MINIVET.

Pericrocotus flammeus, Forst.

The Orange Minivet is a permanent resident, and is not uncommon, all along the Sahyadri range, from the extreme south of the Presidency, to as far north as the hills in Khandesh. It does not occur in the plains.

It breeds during June, July and August, making a small compact nest, composed of fine twigs and grass roots, covered on the exterior with small lichens; it is neatly and compactly built. It is a difficult nest to find, being placed in a fork in a slender bough, at some height from the ground. I have been unable to procure any eggs, as the only nest I have ever found was unfinished. I intended returning a week or so later, but was prevented by illness. The eggs are said to be of a pale-greenish ground colour, streaked and spotted with yellowish-brown.

Khandalla, 31st July. *H. E. Barnes.*

276—THE SMALL MINIVET.

Pericrocotus peregrinus, Lin.

The Small Minivet is generally distributed throughout Western India, wherever there are high trees. It is a permanent resident, breeding at the commencement of the rains.

The nest is a compact neat little cup, composed of fine twigs and fibres, highly ornamented with bluish-grey lichens and small flakes of bark, bound together with spider webs; it is usually placed in a slender fork, sometimes on a horizontal bough. The eggs, three in number, are broadish oval in shape, measuring 0·67 inches in length by about 0·52 in breadth. In colour they are greenish- or pinkish-white, profusely marked with bright brownish-red spots and blotches, with an occasional underlying spot of faint inky-purple.

277.—THE WHITE-BELLIED MINIVET.

Pericrocotus erythropygius, Jerd.

The White-bellied Minivet is altogether absent from Sind, and does not appear to have been recorded from Ratnagiri; in most other parts of the Presidency it occurs as a more or less rare straggler. It is much more common in Khandesh, as the following note by Mr. Davidson will show:—

"This is the minivet of the barren scrub-jungle that grows on the rocky hills in Khandesh and Nassick, and there this bird is very common. I have noticed it also in the Satpooras. It breeds in low bushes all through the scrub-jungle in July, August, and September, laying invariably three eggs, long shaped, often olive green, with longitudinal spots on them."

The eggs in my collection, received from this gentleman, are broadish oval in shape, and are very pale greenish-white in colour, profusely streaked longitudinally with clayey-brown.

278.—THE KING CROW.

Buchanga atra, Herm.

The King Crow, or Common Drongo Shrike, occurs throughout the district; it is a permanent resident; breeding from May to August, but nests are occasionally found both earlier and later. The nest is usually placed in a fork of a tree at some height from the ground, and is composed of grass stems and roots neatly and compactly woven together, but so thin at the bottom that the contents are easily seen from below. The eggs, four in number, are of three distinct types, the most common being pure white, with spot and specks of reddish- and blackish-brown; another almost as common has the ground colour a pale salmon richly spotted and blotched with rich brownish- and purplish-red. The third type (which I have only met

with in the Central Provinces) is a pure glossless white, quite devoid of markings. They are oval in shape, somewhat pointed at one end, measuring about an inch in length by three-quarters in breadth.

280.—THE LONG-TAILED DRONGO.

Buchanga longicauda, Hay.

The Long-tailed Drongo occurs on the Sahyadri range, where it is a permanent resident. Mr. Davidson procured it in Khandesh, but I do not think that it breeds in that district; it is altogether absent from the northern half of the Presidency, or only occurs as a very rare straggler.

They breed during May and June, making a neat cup-shaped nest of grass and fibres, bound together on the exterior with cobwebs; it is usually placed in a slender fork in a tree at some height from the ground. The eggs, three or four in number, are similar in shape to those of the Common King Crow, but are usually much more highly coloured, and average rather smaller.

281.—THE WHITE-BELLIED DRONGO.

Buchanga cærulescens, Mull.

So far as I know, Mr. Davidson, C.S., is the only ornithologist that has procured the eggs of this bird, and he has kindly furnished me with the following note:—

"This bird wanders all over the Presidency in the cold weather, as I have found it everywhere, even in Sholapur at that season. It leaves for the hills early in the hot weather, and breeds, so far as I am able to judge, always in March and April, and not as one would naturally expect, in the rains. According to my experience it only breeds in thick jungle among the hills. The eggs, three in number, are pinkish, spotted, and blotched at the thicker end with purple. They are rather smaller than those of *Buchanga atra*, and more resemble those of *Buchanga longicauda*."

Akrani, Khandesh, *April (fledged young).* *J. Davidson C. S.*
W. Kalwan, Nassick, *March and April.*
W. Bagla, Nassick, *May (young).*

282—THE BRONZED DRONGO.

Chaptia ænea, Vieill.

The distribution of the Bronzed Drongo, in the Western Presidency, is similar to that of the Long-tailed Drongo, but it appears

never to descend to the plains. It is said to be a permanent resident in the ghâts, but I can find no record of a nest having been found within our limits. Elsewhere they breed about March, making a broad saucer-shaped nest, composed of fine twigs and grass, which is placed in a slender horizontal fork, to which it is attached by vegetable fibres and cobwebs; pieces of lichens and small cocoons are often used to ornament the nest. The eggs, three or four in number, are obtuse ovals in shape, of a fawnish-white ground colour, blotched with fawn and reddish-brown, principally at the larger end; occasionally they are white, with a few reddish-brown specks. They average 0·91 inches in length by about 0·65 in breadth.

285.—THE MALABAR RACKET-TAILED DRONGO.

Dissemurus paradiseus, Scop.

The following note from Mr. Davidson, C.S., is all the information I can collect regarding the nidification of this handsome bird: "This is a forest bird, very common in the forests of Kanara and in the Dangs (the hilly country west of Nassick). I have noticed it also in the cold weather in the plains forest near Taloda, in West Khandesh. It makes a largish nest near the top of a high tree in jungle, and lays two or three eggs, of the same type as those of *Buchanga longicauda*, but larger and much more highly coloured, some specimens being blotched all over with purple and pink of various shades."

Dangs, W. Nassick, May and early in June, J. Davidson, C.S.
Kanara May ,,

287—THE ASHY SWALLOW SHRIKE.

Artamus fuscus, Vieill.

The Ashy Swallow Shrike has been recorded by Mr. Vidal from Ratnagiri. He remarks: "Not uncommon in the cocoanut gardens." Mr. Davidson found it to be common in the cocoanut gardens in Kanara, and also in the Panchmahals, in Gujarat. I procured it at Elephanta in May, where it was breeding. The first nest I found was situated in the crown of a palmyra between the leaf stems; another was in a hole, half way up a palm tree. I was unable to climb the tree myself, and unfortunately could not induce anyone else to do so. A specimen I shot had the testes very much enlarged, so this must be the breeding season.

The eggs have been described as white with a greenish tinge, having large brown blotches at the larger end; another type is creamy white, with a broad ring of pale yellowish-brown spots, and clouds and specks of very pale lilac at the larger end. They average 0·95 inches in length by about 0·71 in breadth.

288.—THE PARADISE FLYCATCHER.

Muscipeta paradisi, Lin.

With the exception of Sind,* where it is very rare, the Paradise Flycatcher occurs more or less commonly throughout the Presidency, but retires to the hilly and more wooded portions to breed during the hot season. The nest is a very handsome one, cup-shaped, and is composed of fine grass, fibres, moss, &c., firmly bound together with cobwebs, and ornamented on the outside with small white silky cocoons. It is seldom more than about one-quarter of an inch thick, except perhaps at the bottom. A favourite place for it is a pendant bamboo spray at a point where a few twigs spring up perpendicularly, some of these being incorporated with it. I have found them in similar positions on the outer branches of mango trees; occasionally it is placed in a fork, when it assumes the shape of an inverted cone. The birds appear to breed in both phases of plumage, sometimes one bird is chestnut and the other white; at others both are chestnut. At Abu, where the birds are common, I never saw one in the white plumage, but at Saugor, in Central India, the white ones were most numerous. The eggs are usually four in number, but I have found three much incubated, and Mr. Littledale once found five; but this is, I think, a most unusual number; they are oval in shape, somewhat pointed at the small end, and measure 0·82 inches in length, by about 0·61 in breadth. The ground colour is pinkish-white, sparingly dotted with brick red; these spots often form a cap or zone at the large end; some of them much resemble warm-coloured eggs of the Common King Crow, but are of course much smaller.

Neemuch, June.	*H. E. Barnes.*
Saugor, C. P., May, June and July.	,,
Baroda, May, June, and July.	*H, Littledale, Esq.*
Mysore, May and June.	*J. Davidson, C.S.*

* A specimen was shot at the Munchur Lake, and I obtained another at Hyderabad, Sind. These are, I believe, the only recorded instances of its occurrence in that Province.—H. E. B.

290.—THE BLACK-NAPED BLUE FLYCATCHER.

Hypothymus azurea, Bodd.

The Black-naped Blue Flycatcher occurs more or less commonly all along the ghats, descending at times to the adjacent forest tracts; it is very common at Khandalla, where it is a permanent resident, breeding during June and July. The nest is usually placed in a small fork on the outside of a tree, at a moderate height from the ground; it is a deep massive cup, composed of grass stems, roots and moss, compactly woven together, and lined with fine grass. It is coated on the outside with cobwebs, with which small pieces of lichens, dead leaves, and cocoons are incorporated. Mr. Davidson, C.S., who found several nests in July on the ghats in Khandesh, thus describes the nest:—"It is a very beautiful structure, a deep cup, generally attached to the side of a single hanging twig. Its sides are beautifully ornamented with the white nests of some spider, the pattern being so regular in some cases as to resemble lacework." *

The eggs, four in number, are oval in shape, measuring 0·68 inches in length by about 0·53 in breadth. The ground colour varies from white to buffy or salmon-pink, and they are speckled and spotted with red and reddish-pink, with an occasional spot of pale-purple. They are very variable both in size and colour.

Khandesh, June, July and August. — *J. Davidson, C.S.*
Khandalla, June. — *H. E. Barnes.*

292.—THE WHITE-BROWED FANTAIL FLYCATCHER.

Leucocerca aureola, Vieill.

The White-browed Fantail is common throughout the region, excepting Ratnagiri and the more hilly and wooded tracts, where it is replaced by the next species. It is a permanent resident, and breeds from February to August, but March and July are the months in which most eggs are to be found. They have at least two broods in the year, and if undisturbed use the same nest for the second brood. The nest is usually placed on the upper surface of a horizontal bough, and is difficult to find, as it appears to be a mere excrescence on the branch, with which it assimilates in colour. In shape it is a rather deep cup, about one and a quarter of an inch

* The nest figured was taken by Mr. Davidson at Khandesh.—H. E. B

in diameter, and rather more than an inch in depth. It is rarely more than one-quarter of an inch thick. It is generally composed of fine grass and vegetable fibres, coated on the outside with spider webs. After their eggs are laid, these little birds become very courageous, darting out and attacking any bird that approaches the nest, no matter how large. The eggs, three in number, are broad ovals in shape, and vary from white to dingy creamy-white or pale-yellowish-brown in colour, with a belt of greyish-brown and faint inky-purple spots round the large end. They average 0·66 inches in length by 0·5 in breadth.

Neemuch, February to August. *H. E. Barnes.*

Too common to need further details.

293.—THE WHITE-SPOTTED FANTAIL FLYCATCHER.

Leucocerca leucogaster, Cuv.

The White-spotted Fantail Flycatcher is found in various parts of the Deccan, and is very common in the neighbourhood of Bombay, also at Ratnagiri, and again at Abu. Generally speaking this bird replaces the preceding in hilly and well-wooded tracts. It has not been recorded from Sind. It is a permanent resident, breeding from March to July and even later. The nest is placed in a fork, in some low thick bush, generally a couranda, or in a mango or other tree, at some height from the ground. The nest is composed of the same materials as the last, and resembles it in appearance, but a few straws are left hanging from the bottom, giving the nest an unfinished appearance. The eggs, three in number, are broad ovals in shape, of a buffy-white colour, with a zone of lavender and brownish spots towards the larger end. They measure 0·67 inches in length by about 0·52 in breadth, but are subject to much variation.

Abu, March and April. *H. E. Barnes,*
Bombay, March to July. ,,
Baroda, July. *H. Littledale, Esq.*
Khandesh, May to July. *J Davidson, C.S.*
Nassick, June to July. ,,
Satara, June. ,,

306.—TICKELL'S BLUE REDBREAST.

Cyornis tickelli, Bly.

Tickell's Blue Redbreast does not occur in Sind, but has been recorded as more or less rare from all other portions of our district.

It is a permanent resident in the hilly and wooded tracts, but is merely a cold weather visitant elsewhere. They breed at the end of the hot weather or the commencement of the rains, making a compact, cup-shaped nest, composed of grass and leaves, lined with fine grass, which is placed in hollows in banks, or between the roots of trees, sometimes in crevices or niches in old walls. The eggs, three or four in number, are oval in shape, measuring 0·76 inches in length by 0·56 in breadth. In colour they are dingy greyish-white, closely freckled and mottled with reddish brown; some of them are so thickly marked, that they appear to be dingy olive-brown throughout.

Nassick, June to August. *J. Davidson, C.S.*
Khandesh, ,, ,,
Saugor, C. P., May and June. *H. E. Barnes,*

ROUGH NOTES OF TRAVEL AND SPORT IN KASHMIR AND LITTLE THIBET.

Under the above title, Professor H. Littledale, of Baroda, has printed for private circulation a very graphic and amusing account of his experiences while in search of sport, on the northern side of the Himalayas, in 1888.

We have been allowed to make the following extracts, the first of which will give our readers some idea of the competition which exists between sportsmen in order to secure the most favourite shooting ground,—in this case, Dutchkut nullah in Little Thibet.

March 26th.—Marched from Cheelan *viâ* Dars and Kerrim to Godhaie. At first no road; snow very heavy; floundered waist-deep for some miles. Below Kerrim snow light and path fairly good. Dined and slept at Godhaie; got flour, milk, and fowl . . . Had written so far after turning in at Godhaie in a lumber room of the lambardar's house. At 9 P.M., just as we were falling asleep, a messenger came in from my shikari Nibra to say that the two sahibs who were pursuing us had just arrived at Dars, and that one was pushing on *at once* for my nullah! No time for delay, so up we got, ordered four ponies to be got ready immediately, dressed, prepared some food for next day, put on our great coats and mufflers, took a blanket each, and started! Only two ponies had

come, and I was the first to descend from the village to the path below. What should I see in the moonlight but an ulster-clad figure, striding along the path just before me! "Stealing a march," thought I, as I sang out, "Good evening." The ulster turned round as if pierced by a bullet! But I draw a veil over the harrowing effort at conversation that ensued. Each of us dissembled our joy at meeting so unexpectedly; and the ulster soon fell behind, *to make tea* (a euphemism for getting a pony and pursuing *me*), and T. and I rode on, feeling that we had our work cut out for us, as the ulster was, we both agreed, "a d—d nippy chap," and we should have to go ahead if we meant to win.

Many times we had to dismount, and drive our ponies before us across the steepy path, where a single false step might be fatal. Once a lot of stones came clattering down on us from above as we were scrambling across a steep slope of *debris*, and a stone about six inches in diameter grazed my shoulder and nearly sent me down the slope. We were pretty "nippy" (I thank thee, T., for teaching me that word) in getting across that slope, steep though it was! A night-ride *viâ* Mykiel to Astor is *very* picturesque, but otherwise undesirable. T. and I reached Astor at 6-30 A.M. Our men got in at 8 o'clock, having also ridden all night; and said the ulster had got a pony and was riding on too.

March 27th.—We had breakfast in Astor fort; a jemadar there was most kind in bringing us firewood, eggs and milk; and while we were waiting for fresh ponies, which (the tahsildar said) had to be brought from a village three miles away, we saw to our dismay and anguish, that nippy ulster riding gaily past on a fresh pony that he had obtained just outside the fort! The agony of those three hours we waited for the ponies! However, I did one thing that somewhat assuaged my torments. I got the tehsildar to send a smart boy on to Harchoi and Duskin, and have fresh ponies ready for us at both those stages on the way. Right well did that youngster nip! At 11 o'clock one pony turned up, and the other was "âtâ," so, as it was my nullah that was in most deadly peril, T. very generously let me take the first pony, and, throwing my blanket over the rough saddle, off I galloped down a steep mountain goat-path; but the pony was a sturdy one, and took me along well. Ten miles passed quickly but still the ulster was not in sight; he had nearly three hours start, and a good pony, and made use of his chance. A little beyond Harchoi the fresh pony met me—a little rat of a thing, about eleven

hands high, but with the heart of a thorough-bred, the most spirited little pony mare I ever rode! After an hour's hard riding I was evidently gaining on the ulster; his *pugs* (I have a good eye for pugs) were beautifully fresh, and at length, on rounding a corner, there was the beloved object just rounding the next corner, not quite a mile ahead! His pony was clearly dead beat, but he was nipping on gamely, and got to Duskin first. When I got to Duskin I found the reserved pony was not up to racing form, and there was no other, so I booked the Duskin pony for T. The ulster was down in the valley a mile below, whacking the lambardar, who (I heard afterwards) refused to produce a fresh pony. The little pony's owner agreed to let me take her on to Turbyling, a vision of five rupees if I won, illuminating the dim but glorious vista of his future. Off I galloped along a flat stretch of road for four miles, the pony-wallah cutting along after me. From the hill-top I cast a last longing, lingering look behind: no sign of the ulster, so I had now recovered my original start. But there were fifteen miles to be done, the last ten on foot, alone, and in the dark, and I did not feel at all sure of the result. No use trusting to the adversary giving in; he was much too experienced a traveller to let himself be outraced by a mere griffin; there might be more of his night-marching tactics, and I resolved not to stop till I was fairly in my nullah that night. Just beyond Dogni I let the plucky little pony go back. Her owner fell at my feet when I gave him the five rupees! It was sunset, and I had to traverse the precipitous Ráunghát alone and in the dark, until 8 o'clock, when the moon rose. On I plodded, with my blanket over my shoulder, hardly able to walk, parched with thirst, up and down, across shingly slopes, along sheer precipices, a weary way indeed. At times I felt quite done, and lay down on the path to rest my back, and thought of chucking away the blanket, but the rattle of falling stones from the cliffs seemed to me to be approaching footsteps, and I was up and off again.

Like one that on a lonely road
Doth walk in fear and dread,
And having once turned round walks on,
And turns no more his head;
Because he knows an ulstered sahel
Doth close behind him tread?

So on I toiled till at last the last ascent was over, and I stood in the "cauld blast" on the summit of the pass, and could see the Rámghát rope bridges, two dark lines far below, crossing the white foaming

Astor river, there rushing to its junction with the Indus. There was not a sound from the lonely path by which I had climbed. I had only a mile or two further to go, so I rested for a bit on a rock, and then began to descend the track. Suddenly I heard a deep growl, and saw a black object move on the rocks about 15 yards below me! "A bear," thought I; and picked up a big stone, with which I let drive. A thump, a yowl from a dog! and up jumped some men from the rocks beside which they had been sleeping.

The situation was soon explained. They were travelling from Gilgit to Astor, and were resting there on the ridge. "Give me some water, I am dying of thirst;" and I soon had a little gourd to my lips, and drained it. Then they offered me bread, but hungry though I was, I could only tackle a few mouthfuls. I gave the man who gave me the water a rupee, and asked him to guide me down to the fort, which he did; and he also let me keep the little gourd as a memento of a most blessed drink. It was 10 o'clock when the Rámghát sentries finally made up their minds not to shoot, but to let me pass the fort and bridge; and in another half hour I was asleep on the sand beside a rock, with my blanket over me, careless of ulsters and night marches indeed, for I was in *my* nullah at last!

March 30th.—Twenty-three oorin (*Ovis vignei*) came down close to the hut last evening. Unluckily my binoculars are with the heavy kit, now at Astor, and I have only four cartridges with me.

At midday I set off along the Boonji road to look for oorin. A large herd—about 40—came down hill, crossed the plain, and went down so the Indus to drink. While I was stalking them a shot in the distance set them off, and I fired two shots at the leading ram, about 400 yards, as they stampeded. The shots fell very close—not more than a foot away. The herd went quietly up hill and began feeding on the slopes. Mamdu and I sat down behind a rock and watched them for about an hour; they fed over a ridge, and into a ravine.

We hurried up the slope they had quitted—about 500 yards climb—and peeping over the edge saw them on the opposite side of the ravine, about 250 to 300 yards off, and somewhat below us. Aiming at the biggest ram, I fired, and hit him in the flank; and with the left barrel hit him again in the neck; still, he went on, and I had no more cartridges. After going up some rocks he lay down, but bolted again a short distance when Mamdu got near him. I signalled where he had gone, and Mamdu got down to him, and caught hold of him; but up he jumped, and Mamdu let go! He

went about 50 yards down, and fell over, dead ; Mamdu got down to him, and *halaled* him (low down, to save head skin). The horns measured 24½ inches. The festive tiffin cooly hoisted the body on his back, Mamdu taking the head. Joyful prospect of mutton-chops. Had a beastly scramble down the steep path in the dark, but got in safely.

March 31*st.*—Busy skinning, &c., The head skin very skilfully taken off by Mamdu. Irides pale yellow. Several very pretty little birds about ; a little black and white bushchat and a white-winged redstart (*Pratincola caprata* and *Ruticilla erythrogastra*) keep at work just in front of the door It is quite a week since I have seen my cook ; left him at Boorzil to follow with the kit when we pushed on. In the meantime my culinary implements and materials are : A Warren's broiler, a small kettle, a concave iron pan for baking chupatties, a leather botel (*chagul*) for water, two plates and two tumblers of enamelled iron, two forks, one knife, three spoons, pepper and salt case, pot of Liebig, tin of Epps's cocoa, and the following supplies from Boonji : A block of sugar, some crystals of rock salt, 14 lbs. of coarse gritty flour, a bag of dried apricots (called *kobaini*), several dozen eggs, and some fowls. The eggs in various stages of decomposition. Besides there is the *oorin*, which is really very good mutton. Now what more does the hunter want in the way of wittles ! As to the process of making chupatties, it is too awful. Mark Twain's " I pass" comes to mind as one watches the wily native patting a lump of dough to and fro in his filthy hands, but the final product is not bad, though, like old port, I fancy there is a good deal of " body " in it.

April 9*th.*—A foraging day. The cook announcing that the larder is empty, I resolve to go for the oorin seen the previous day. Of course not an oorin was seen all day, and so the poor dog got none. I rested on a ridge overlooking Boonji plain, and while grazing about me, a tiny little leveret, about three days' old, came hopping up to me as I sat still, and squatted down a yard from me. I easily caught the little thing, but it squealed so that I let it go soon, and off it scampered among some stones. There are many ram chikore (*Tetraogallus Himalayanus*) on the hill, and they are pairing—an affair that evidently requires very great eloquence on the part of the male bird. Lower down there are chukor (*Caccabis chukor*) scattered about, some already in pairs. No markhor seen to-day.

April 14*th.*—Got the markhor to-day that I had seen the first day

I went out; disappointed to find that his horns were only 25 inches after all. We went up the nullah as on the 11th, and I spotted them, three males, two females, about half a mile above us. They went up a ravine, and we followed, but a drifting cloud covered the nullah, and we took the left bank while they had gone up the right. We worked up till, at 5-30 P M., Nibra saw one on the other ridge far below us. He and I crossed three ravines, and quickly got to the place, but the breeze (as usually at sunset) had shifted, and they winded us and were 200 yards off in the next ravine where I thought I was just 20 yards from them. The sun was right in my eyes, but I hit the old fellow as we went up the opposite ridge. I had put up the 200 yards' sight, and N. said I had hit him in the hind leg, so I thought I must be low (found afterwards I had smashed his hip), and put up the 250 for the left barrel. This went just over his back; he was limping slowly along the edge of a steep sheer rock, and lowering the elevation to 200, I fired again, and plugged him fair in the middle ribs, and over he went, heels over head, right down the precipice, about 800 feet from rock to rock. The core of his left horn was broken, and his skull and jawbones were in fragments. With the left barrel I knocked over one of the smaller ones, but he only fell a few yards, picked himself up, and went out across a glacier on to a bed of deep snow in which we lost sight of him. (I got him when the snow melted, and found that the horns were barely 18 inches, so I threw them away.) These were my first markhor, but now I shall be able to judge better of the right size to shoot at, and will spare the small fry.

April 15th.—Right up the hill tops, along the very crags where those six old ones had gone the other day, but we only saw the surviving young male of yesterday and some female markhor.

The number of Lammergeyers (*Gypaëtus barbatus*) one sees is quite surprising. I saw one nest, but could not get at it. Two ram chikore alighted on a rock within ten yards of me and never saw me. The male bird went on bowing and waltzing and crooning to the female just like an old cock pigeon; then he would throw his head back and scream! So he went on for quite five minutes, until a Lammergeyer sailed overhead, when the pair flew screaming away.

April 17th.—Path up nullah, partly along river bed, partly on the face of a cliff, very bad going. The way the coolies, with loads of 80 lbs., get up these places is quite marvellous. I find even a rifle too cumbersome for some of the bits these men scramble up, loads and

all. It is very warm here at midday, the rocks being quite bare and the valley narrow and steep; but after sunset an icy wind comes sweeping down from the snows above, and there is a continual rattle of stones. They fly in regular volleys, leaping 100 feet at a time, kicking up a cloud dust and crashing like a battle. Many animals are killed thus, and occasionally men too. Hence the choice of a camping-ground is a matter requiring deliberation, and it is always safer to avoid the river-side and get up on a ridge, even though water may have to be brought up. I saw to-day, at 9,000 feet, the first pair of blackbirds—there was no mistaking the dear old "ouzel cock with tawny bill," and they seemed to be preparing to nest hereabouts.

I did not think of shooting them; but I find from Jerdon, Vol. I., p. 527, that if I had done so it would have settled a doubtful point of ornithology. One has to put aside zoological researches that require shooting, if one wants any game to remain in the nullah. Another old friend I met on the way up was a wild raspberry bush just coming into leaf. I also caught a black lizard, red speckled beneath, and he is now "spirited away" with sundry snakes for a friend.

April 18th.—Cloudy morning; started up hill to explore new ground; rain came on, but we persevered. Saw a pretty white-headed red-start (*R. hodgsoni*), and watched the little dippers (*Hydrobata sordida*. I at other times saw *H. asiatica* and *H. cashmiriensis*) plunging into the turbid swift flowing torrent, and timed their dives, the longest being 43 seconds. The redstart kept on spreading out his tail (like a fantail flycatcher), and making darts at flies on the face of a rock. While climbing some rocks at 10,000 feet an old hen ram chikore flew up clucking from a ledge of rock about ten yards above me. "Eggs," thought I, and scrambled up to the place, and there was the nest, about a foot in diameter, in a sheltered little crevice, a few twigs as a foundation for a thick layer of her own grey feathers; and six eggs, very like capercailzie eggs, but larger. Nibra told me that they lay 18 or 20 eggs, but as these eggs were hard set and very troublesome to blow, that old bird had laid all her eggs clearly, and unless hens club together occasionally (as I think weaver birds and munias must sometimes do, and some of the *phasianidæ*), I fear Monsieur Nibra was telling one of his not infrequent "corkers." Well, allowing 12 days' incubation, and six days for laying the six eggs, this snow-hen must have had her

nest ready on April 1st, of which sportsmen take note. Saw no markhor to-day.

April 22nd.—Had not climbed far up the cliff when Mamdu spied a markhor on the skyline half a mile above us. The wind was down hill, so we watched him, a fine old fellow, with wide sweeping horns, and saw that he was accompanied by one young male,—evidently our missing two of yesterday morning. Up we scrambled, and luckily found on a flat rock a shallow pool of rain-water, three-fourths of a pint perhaps, which we shared. Much refreshed, we were climbing on, keeping to the left out of sight of the markhor, when Mamdu said "a man is coming down towards us." And so there was, Rehman with another cooly bringing food, &c. I at once said to Nibra, "Get over to that rock; the markhor will come down from those men;" and the moment we got to the ridge N. excitedly exclaimed: "Banduk jaldi kholo—markhor bilkul nazdik hai!" · ("Uncase the gun quickly—the markhor is quite close.") We ducked down; I had the rifle out in no time and shoved in cartridges; but the old fellow had caught sight of my hat and turned back, and was bolting down the rocks as hard as he could leg it about fifty yards off. Aiming steadily I let drive, but thought the thud sounded as if the bullet had smashed on a rock, so I ran across to give him the left barrel, when he should reappear in the nullah far below. There was a great clattering of stones, and down he came, but not galloping! Rolling and rolling, on and on, dead as a nail, for about 300 yards he rolled and then lay in the nullah, with the stones still dancing past him that had been loosened by his fall. "Got him, Nibra!" "Salaam, salaam, Saheb!" from the delighted shikari. Rehman and the other cooly come down as we are "bucking" about this bit of good fortune, and we send them down to take the trophies, while we pitch into the chaguls and tea and grub. Then we light a fire behind a rock. . . . Here he comes, out with tape:—

Horns round curve, 43½ inches.
„ circumference 11¼ „

A fine old billy-goat and no mistake. Despite his tremendous fall and roll the horns are uninjured, but the skull is cracked and the lower jaw smashed to bits.

April 24th.—Shortly after starting at six I saw three old male markhor. While stalking them I found that the sportsman in the adjoining nullah of Sheltar was simultaneously stalking the same animals.

We met, and resolved ourselves into a friendly boundary commission, with the result of proving that my visitor was at present camped and pursuing game within the limits of my nullah: but as he had not up to date been successful in getting a markhor, I asked him to finish the stalk, and went to camp.

In the evening I went down my ridge, and fired at and missed a good markhor. He was lying down and I could only partly see his head, about 100 yards below me. If I had only had the patience to wait he would have stood up and died, but his *kismet* was good, and Zeus, the son of Kronos, took away sense from me, and I fired at and missed the little patch of neck that was visible.

We used to call this markhor the "Dost" (= friend) afterwards, as he always turned up at that place when wanted, and a little male (he who had been with the big one I shot) attaching himself as scout to the old fellow, my men called him the "police-wallah," he was so vigilant. I never got that old "Dost," but he disappeared and I fear got into trouble through going round into Shaltar once too often.

April 28th.—I made a really good stalk to-day, and shot a fine markhor, 38½ inch horns, girth 10½, divergence between tips 33. The morning was fine, but the aneroid had fallen to 20·15 and clouds gathered at 8 A.M. I had intended going towards Rámghát along the ridge of the hill, and sent Nibra off at 7 to scout for that old fellow I missed so idiotically the other day. He came back soon to say there was a herd of markhor in the west ravine, about 800 yards lower than the camp. By this time the sky was quite overclouded, and the wind all over the place, so, though they were spendidly placed for a stalk, I refused to attempt it, and waited till 1-30 at the camp, hoping against hope for a steady wind uphill. At 1-30 the sun came out overhead, the sky cleared at once, and with the increased surface heat the breeze began to come up fairly steadily, though still veering a little now and then. However, I decided to chance it, and down I went with the two shikaries, leaving Rehman on the cliffs above to watch; with great care, frequently tossing pinches of dust into the air to test the wind, we clambered down the spur. There were three female markhor high up in the ravine; then a single one lower, as a link; and then three males still lower down, lying together asleep in the middle of the dry stony bed, here about 200 yards broad (I should mention that the branch or side ravines are usually dry, as more stone than

water flows down them). When about 500 yards from the markhor we got full in their view, but by crawling very slowly, in our grey *puttoo* clothes, over the faces of the steep rocks, we managed to get to 350 yards without attracting notice. Then it was plain sailing down a gully to about 200 yards, whence, leaving Mamdu with the alpenstocks, we carefully descended about thirty yards further. Crawling out on a rock we peeped over. Not a single markhor was to be seen! Every one of the three males had vanished. How we blessed the wind! We must have been winded; but where had they gone to? We scanned the nullah up and down, but in vain. At last some slight movement on the rocks opposite, about 250 yards away, caught my eye. Yes, there was a female markhor lying down quite at her ease—she suspected nothing. And then we gradually made out our three friends—one big and two moderate sized; they had climbed about 50 yards up the precipice facing us, had comfortably ensconced themselve in holes under stones, and were just settling down for a siesta. The biggest fellow was not comfortable enough, so he got up, bntted a smaller male out of his bed, and lay down in it. The small one, much disgusted, went on a little further. We meanwhile were in full view, but got across about fifteen yards of a ledge while the fighting was going on, and so behind a yew tree. Here we waited. Then the big one jumped up, and followed by one small one came quickly down the rocks to have another feed of the green grass below. We crawled a few yards more, and fonnd that we could not get an inch nearer without being seen. The three females were right below, 150 yards off. The big one walked across and joined them. My chance had come. Lying flat out on the overhanging rock, I put my hand back for the rifle, which N. drew from its cover, and passed up to me. Quietly loading it I took careful aim at the markhor's shoulder as he stood broadside to me, and slowly pressed the trigger. At the shot he swung round and made a bolt. 1 fired again hastily and missed by a few inches. After going about 30 yards he stood with his back to me and I fired a third time. I felt sure I had hit him, but he hopped up the rocks opposite, and then Nibra said "his shoulder is broken; he is going on three legs." He climbed about 20 yards, slowly pausing several times, and then fell head over heels down again into the nullah. Taking my penknife (the shikar knife was behind with Mamdu) N. scrambled down and *halaled* him. When I got across Nibra pointed to his left shoulder, all smashed with the

express bullet. That was shot No. 1. Turning him over, I showed the sceptical shikari the other bullet hole, right through the lower part of his back. A good stalk well ended, and pointing the moral that if the wind is unfavourable one should wait till the clouds roll by. The camera did not get down till 7 o'clock, when I photographed the old fellow, using full aperture and giving 45" exposure, but the negative even with that proved to have been under-exposed. By the way, let me warn photographers in these altitudes that double or treble Indian exposures may, and indeed often must be given with ordinary plates.

May 2nd.—Right down to the bottom of the valley there is snow; here at the tent-door it is a foot deep, and the weight on the canvas (I am in a tiny single fly-tent, six feet by four, and four high—weight 25lbs.) was so great that I had several times to thump the roof to make the snow slide down. The ridge beside which I am camped is composed of masses of shattered and sharp-pointed rocks, when masked under a layer of snow, climbing across them is far from pleasant, or indeed safe. As the weather seemed more promising we set out along this "path," however, and with difficulty getting down to a broad shelf to the S.-W., saw below us eight male markhor, with but one moderately big one, say 30". We also saw the "Dost," but he was on his usual inaccessible beat, and after spending four hours in trying to get up to him, we had to leave him in peace. Then we worked down a spur, ending in a sheer precipice not far above the river. From above one could not see the face of the cliff; it was too steep and rugged; but beyond it, on a large boulder below, a female markhor was standing sentinel, and I concluded that the herd of eight males must be near. Climbing down to the left we got on a ledge of rocks that gave us a view of the face of the cliff: and there five of the animals were lying on small ledges here and there in the very middle of the precipice—a place that no four-footed creature but a wild goat could have possibly approached. The wind had been rather unsteady all day and soon a female gave her note of alarm. The five males on the cliff began moving down, and I was aiming at the biggest fellow, that was highest up, when Nibra said "not at that: fire at the second one." As he had been looking through the binoculars I thought I had probably mistaken the big one, and so I fired (180 yards) at the second markhor as I was bid. Over he went, right down the cliff, a fearful depth to fall, quite 100 feet sheer drop. Mamdu by

going round a mile got down to him, and my disappointment can be imagined when I found that the 30-inch one had been let off, and that I was the possessor of a 22½-inch head, through taking my precious shikari's advice. The body and bones were all shattered, but the horns, massive looking, were not damaged.

May 9th.—Went up ridge towards the east; not much snow to climb through. The three big ones that had been fired at by my neighbour were spied far up in the precipices above us . . . We are now on a level with the three, about 250 yards off, but I mean to make it 50 yards before I fire, having about 100 yards of deep snow to cross, and 100 yards of a glacier to get down, and then some rocks to climb! . . . They do look three rippers, and one must be forty-five at least! Had a hard climb over the snow slope, which was steep and slippery, and soft in places, though only once up to my elbows, but at last the yew-tree near them, the destined firing point, is reached, and I peer through the thick foliage. The big fellow is there, some 60 yards off, lying down on a pinnacle of rock and gazing (with that sad far-away look one often notices in these animals when watching them through a telescope) down into the valley: the other two are not visible, being lower down, between him and me. I was not very steady I fear, but it looked too easy for any doubt of success, and taking aim through the yew boughs, I fired. The old fellow fell backwards and out of sight. "Mara!" I cried to Nibra, and jumped up for the left barrel, just in time to whang it fair into the bigger of the other two markhor as they dashed past about 30 yards off, and over rolled number two. Having duly *halaled* him we went up for number one. He had vanished, and there was that fatal and perfidious bullet's mark an inch too high! Horrid sell—a miss through sheer cocksureness: number two is a handsome markhor however. Horns 34 inches long, 12 inches girth, 30 spread; a clean graceful head.

Photographing the slain took a few minutes, and then, leaving Nibra to look after the trophies, I took Mamdu and Rehman with me, and went down hill intending to take up the tracks of the big one, and perhaps come on him. After descending about half a mile, we had a careful survey of the valley with our telescope and two pairs of binoculars. I made out a markhor, a small male, lying on a rock about quarter of a mile off, and somewhat below us, and then we made out others. They were on a sort of rocky plateau,

with a few yew-trees stretching their arms from crannies, and a deep stony nullah lay between. We could not make out any big one, but it was mid-day, and big ones would then have been lying in the shade, and probably invisible, so we worked down carefully to a ridge that gave us a good view and a good place to stalk from, and watched. At 5 o'clock the markhor had fed down to the steep bed of the ravine between us, and were crossing to our side. I had got a glimpse of what *seemed* a big markhor earlier in the afternoon, but he was among some yews. I could not see his head, and we did not again catch sight of him, but on the strength of the doubt I resolved (luckily) not to fire at anything even medium-sized. Carefully working down the crags now and then in full view of the unsuspecting herd below, who were too intent on the young grass to be very watchful, I got to within 200 yards, and found that the herd had increased to thirty by additions from our side of the ravine, but that out of ten males there was only one head worth a bullet, and it only 27 or so. Acccordingly I decided not to fire, but to follow the herd closely as they fed across ridge after ridge, and just watch the animals without alarming them, though they were scarcely fifty yards off. It was now 7 o'clock, but the wind was still steady; and the sun was sinking behind the hills of Gor, and I was beginning to reflect that I was likely to be belated and have a lodging on the cold ground instead of dinner, the *Asian*, and bed. Suddenly Mamdu whispered: "There is a big fellow on the edge of the slope;" and there, indeed, was my very friend of the morning, a grand old shaggy white-haired long beard, with horns sweeping straight up from his stately head! He was standing in the shade of a yew about 300 yards off, below and opposite. He seemed to ignore the great herd passing him, and came slowly down the slope as the band of youngsters worked up it. The darkness was falling fast, and I feared that the herd would not be all across the ridge before it became impossible to shoot. I looked at my watch—it was five minutes to eight as the last small one passed over and out of sight. The big fellow had moved down below some rocks, but I had a good notion of his whereabouts, so I hastened very circumspectly down the steep grassy hollow, avoiding the numerous loose stones as well as I could. Now a bent stick thirty yards off seemed in the gloom to be his horns, and I paused; but a look with the binoculars showed that it was not the veteran, so down I crept with rifle at the ready, to the edge of the rock, beneath which I

expected him to be. He was there not twenty yards below me, and our eyes seemed to meet at the same moment! Off he bolted; and with as much steadiness as I could I aimed at the vanishing white object, and fired. He did not even swerve, and I quickly fired again, but he galloped on round a boulder and out of sight. Mamdu (who was close behind) said he thought the first shot had hit him, and I had that sort of instinctive feeling the rifleman knows of having been on both shots; but in the gloaming one could not be sure, and it was with no little trepidation that I descended to enquire. We soon caught sight of him, standing about 100 yards off at the base of a cliff, partly hidden by a yew tree; and sitting down I fired, when he made a rush, and vanished beyond the tree. Coming up, after few moments of supense, Mamdu said: "Got him." And there he lay, quite dead with bullet No. 1 in the middle of his back, No. 2 chipping a little bit off his right horn and No. 3 through his shoulder and heart. He is a burra wallah to look at; and does not belie his looks, his horns being 46 inches round the curve, 13 inches in girth, and 30½ inches between the tips. A prize indeed! We soon had a fire blazing and made ourselves ready for the night. We had no blanket, but it was not cold; there was a little water in the chagul, which, with some scraps of tiffin remaining in the basket, and the invariable pipe, sufficed for dinner. I could not sleep, however,—hating this sort of lodging on the cold ground—and spent the night, as usual on such occasion, in smoking and adding fuel to the fire. The old billy-goat favoured us with a "bouquet de bouc" more powerful than pleasant whenever the zephyr came round from his vicinity; but "bukri bonns est odor quâlibet ex re," as Vespasian might have observed had he been present, and I would not object to such a perfume distilled from such a *stalk*, every day of the year. Yet I must say that I never felt less keen to take a wild animal's life than I did to slay that magnificent old markhor; he looked so dignified and venerable with his flowing grey beard and noble mien, that I could not help thinking him like one of those reverend patriarchs that Blake had drawn so well in his *Book of Job*, or Flaxman in his *Dante*; but the primæval savage in me prevailed, and the noble old chap succumbed to Holland and Holland, after escaping in the morning.

May 10th.—Having had no dinner and no sleep, the climb up was tiresome; but all things have an end, and I got in, dined and breakfasted, and went to bed. In the afternoon I put arsenical soap on

the headskins, and packed them and the heads for their journey to Mahdoo, the eminent taxidermist(or *mochi*) at Srinagar.

May 13*th*.—The evil destiny of the female sex, with the best intentions in the world, to get their male relations into trouble, could hardly be better illustrated than in the case of markhor. It is the females who are always on the watch, while the males are snugly asleep under some rock; we see Sister Anne on her watch-tower, and so discover the abode of old Blackbeard. To-day I have been up to the highest crag over the Rámghát valley, climbing from 6 to 12 o'clock, and have only just found game. About a mile below me, on the edge of the cliffs about the river, when we had given it up as hopeless and were planning to go after ibex to-morrow, out walks a cautious female, looks round, skips up on a smooth round rock, and settles herself to survey mankind from Astor to Rámghát. Couched on the rock, she is watching the hillside closely, but we have been watching longer than she, and her eyes won't light on us just yet. Perhaps in the coming by-and-bye we may meet for a brief ecstatic moment. Nothing to do now, but lie in a crevice of the rocks from 12 till 4 or 5 o'clock, when the family will come out to graze . . . Family don't come out, so we call on them, and find only one small (18") gentleman and three ladies at home. Sleep under an overhanging rock comfortably enough.

May 21*st*.—A long day's work. Started at daybreak across the valley, descending to river, and finding a practicable path up the opposite cliffs after several failures. Then struck along ledge of cliffs about half a mile below the ibex, 31 in all, intending to have a go at the markhor first. After climbing for 3½ hours to the shoulder where the markhor had shown themselves yesterday afternoon, we sighted them about a mile below us in a steep ravine. It was too far to go down again, so we went on for the ibex. The two biggest bucks and two females were in a small ravine near us, say 600 yards off, and the rest of the herd were scattered about, some lying down, some feeding, some skipping about and playfully butting at one another. It was my first sight of ibex near at hand, and I was surprised at their appearance, my idea of an ibex having been based on the picture of a European ibex that (taken from the Old Shekarry's *Sport in many Lands* and Cassell's *Natural History*) does duty for *Sibirica* in Sterndale's *Mammalia*. Instead of an agile, slender, gracefully-stepping creature, I found the buck ibex to be a heavy yellowish brute with short brown legs, a very massive barrel-

shaped body, almost pig-like in his gallop, and with shaggy flanks and neck and beard. Neither in mien nor gait is he such a fine-looking animal as the markhor; at the same time his activity is equal to the markhor's. The two big fellows got angry about something or nothing, and had a very serious butting match for full five minutes. After it, to our great disappointment, for they had been splendidly placed for a stalk, they set off, about 11 o'clock, to join the rest of the herd, and went along the hillside for quite a mile and a half, some of the females going too, and others remaining scattered about, thus blockading us completely. As the day wore on they mostly lay down to sleep, lying quite flat on the sides with head thrown back, and all four legs stiffly stretched out, not doubled under them, basking in the sunshine. So we had to sit behind a rock and watch the big ones loafing on and on, further away from us, while we dared not budge lest the scattered females and small males should discover us. Over a distant slope the big ones went, and gradually the others followed, all passing out of sight, except five females that seemed disposed to sleep all day. But at 5 o'clock they too rose and quickly trotted after the herd and over the slopes, and the coast was clear at last, so far as we could judge. The ground, however, was a network of stony ridges and ravines, with yew-trees and thickets here and there, and we could not tell whether all had gone or not. However, as we had two miles to go, over rugged ground, we started. When half way, two shrill *whistles* above us from four females that had been lying higher up and had winded us, showed that we were caught; but though they repeated their signal five or six times, they made uphill instead of following the herd, and we went on. At the crest of the ridge we had to wait once more, as the big ones were far below, feeding, and three females were lying close to us. The wind came steadily up, though it was now 7 o'clock, and soon the three sentinels rose and went down to the herd below. We followed, keeping below skyline on the outer side of the ridge, and soon got to within fifty yards of where the big ones had last been seen, but there was no sign of them anywhere. Some females saw me peeping over, stared suspiciously for about four minutes, while I kept quite still, trying to catch sight of the big ones, who were somewhere close by. Then the wind veered, a general stampede took place, and out bolted in the crowd the two big fellows from right below me! As I stood up to get a clearer view, the boughs of the yew caught the sling of the rifle, and so checked me for a second or two, and the big ones

had got to the other side of the ravine, about 130 yards off, when I fired, only the bigger of the two being in sight. I had the old 12-bore rifle in my hand, the Express being behind as a second rifle in case I got more shots, as often can be done with ibex, and aiming steadily, I fired. The ibex bolted at once, and I could not fire the left barrel, he having got into a hollow that hid him; when he reappeared about 200 yards off, I fired two shots with the Express, but went high, Nibra said. The herd made uphill, but the big one took a downward course. Once he slipped and staggered, and I exclaimed "he is falling," bnt he recovered himself and went on, and Nibra said I had missed him clean. He disappeared over the edge of a cliff, and did not reappear. I watched the others for a bit and then asked where the big one was. They said he had not yet come out of the ravine, and then exclaimed, "there he goes, not hit." He climbed slowly along the face of the cliff, and then pulled up on a sloping rock, in full view of us, about 500 yards off. We were watching him with our glasses, and all at once ejaculated "khun!" (blood); a great gush of blood was streaming down the rock from him. He lay down for about five minutes, then painfully rose, walked three or four yards, and lay down again, the blood crimsoning the cliff beneath him. He was hit, and hit vitally and hard. Old Joe Lang had gone straight as usual. We followed, but the ground was so bad that we had not got to the cliff when darkness came on. It was impossible to get further over such dangerous ground in the dark, so we made ourselves uncomfortable for the night, under a yew tree, and lit a fire. At 2 A. M. a heavy thunderstorm came on, wetting every stitch of our clothes in five minntes, and we passed the rest of the night very miserably indeed, drying our steaming blankets and kit.

May 22nd—At daybreak, just as we were getting ready to start, we heard a terrific crash from a precipice far overhead, and some fifty tons of enormous stones came thundering down, several passing right over us, so swiftly that only the whizz was heard, but the stones not seen; and soon after, a single stone plunged right in our midst, ploughing a hole in the ground a foot deep and spinning on to the river half a mile below! Having made tea, we proceeded to search the precipices for the lost ibex—a wearisome perilous quest, and unsuccessful, the rain having washed off every stain that had yesterday incarnadined the rocks, and obliterated every footprint in the gravel and sand. Our only hope now is in the crows and vultures. By watching them we may yet be guided to the place.

May 30*th*.—Up ridge to point over Shaltar. Saw a tent there. I had expected to find Shaltar unoccupied, and have a few days round it; so went down my boundary. No sign of the markhor seen yesterday; worked towards home, but low down, carefully exploring ground; saw nothing all day, but in evening came on them just a quarter of a mile below my tent! There were 53 markhor there (the three herds packed), only eight males and only two of those worth shooting! Leaving the fussy shikari, I made a fair stalk alone, but had to cross a ledge of rock about 200 yards from them, and full in view, and a female gave the alarm. I ran forward as they made up the cliff; they came across my front working up the steep sheer cliff. When they were opposite, about 180 yards off, I fired and hit the biggest one; he stood on the rock motionless, and as I did not feel sure of his being sufficiently hit, I fired the left barrel, and down he tumbled. The two bullet holes formed a figure of eight in the skin of his shoulder. I had rested the rifle on my hat when firing, so there can be little doubt that those two barrels shoot together, and are a credit to Holland and Holland. His horns were only 24 inches, but massive.

May 31*st*.—Having now got ten markhor (measuring 46, 43½, 40, 38½, 34, 28, 25, 24, 22½, and 18 inches), and the weather being very hot, I mean to take it easy and loaf back to Kashmir. I shall perhaps pick up some ibex on the way in Dirrell or Loyen Harda. If not, I do not much care, as I shall come this side again, and spend a winter over the passes, and try for some specially big heads up beyond Gilgit or in Chilas.

June 8*th*.—Started up nullah, for one last day at the ibex. Found nest and three eggs of the White-browed Bunting (*Emberiza cia*); nest on ground beside a tuft of grass. Shot male—somewhat greyer on head than are European specimens. I fancy a transitional form to the Eastern *E. Stracheyi*. *E. cia* is common in these parts. Called on Mrs. Chukor, but she had deserted her nest, so I took it, 12 eggs, quite fresh.

June 9*th*.—Up to glaciers early. Climbed from 10,800 up to 14,000 feet along front of the ibex cliff. Ibex not within reach yet. I must sleep on cliff and make a two-days' climb. Saw a lovely bird, of which I noted the description at the time, and find it is *Accentor immaculatus*, the Maronne-backed Accentor. Jerdon says it has hitherto been only sent from Nepal and Darjeeling. It was at 13,000 feet in Dutchkut, where I saw it only once. Also saw a

lot of so-called Snow Pigeons (*C. leuconota*). They were breeding at 12,000 feet in clefts of the chasm down which the right branch glacier stream flows, but out of reach. The alpine flowers now are in full bloom; a mere enumeration of them would be too long (even if I could name one-tenth of them); from every nook and corner of the rock they peep, and on the mountain meadows the air is sweet with perfumes. It is delightful to meet so many old friends among the flowers. The forget-me-nots form mirages of blue, they grow so thick in places.

June 11th.—Started up ibex cliff at daybreak; got right on top and along ridge to 15,600 feet, a beastly climb, along the face of a precipice 1,000 feet sheer in parts; made me squirm to look down. On the very top there were two little grey guinea-pig-like animals, some species of *Lagomys*. Their home was in a crevice under some icicles. Sterndale gives a number of species, but I am bringing back one of this sort for the Bombay N. H. Society to identify.*

June 21st.—Goorkhot to Chougam. Shot a mountain fox (*V. montanus*), or vixen rather. She was stalking some chukor when I interposed. Came along Ruttu plain opposite Mir Mullick nullah, a very fine valley, with pine forests and snowy peaks. Splendid view of Nunga Parbut or Dayamur, *nive candidum* from head to foot. Got to a hamlet and had the tents pitched just as heavy rain came on. I have just been watching a curious veterinary operation. One of the baggage ponies being footsore, the Bota (=Tibetan, if Bootan, Bodpa=Tibet,—&c.), heated a large flat stone in the fire, making it very hot. He then placed some green leaves (gathered from a sort of *Coleus* apparently) on the stone, made the pony place his fore-hoofs on the herbs and poured water over them), thus causing a cloud of vapour for some minutes, the pony standing quiet and seeming to enjoy his vapour footbath.

June 23rd.—In bed with a badly sprained ankle, which puts an end to my shikar, I fear. Yesterday we had arranged to move the lighter camp up the nullah, and a man was to come to show us the place where a bear had been seen lately. At 4 P.M. a villager rushed up to say that a snow bear was at that moment killing the sheep on the hillside opposite Dirroll village. We were off at once, and on reaching the huts could see the bear on the grassy slope above some sheep and goats, while a herdsman was

*Royle's Pika, or Royle's Mouse-Hare, *Lagomys roylei*.—EDITOR.

hastening towards the place to drive the bear away. We pushed on, having to make a detour to cross two bridges, when suddenly a general cry from the village of "he's killing the man" made us tear along as hard as we could go—I leading and the two shikaries scuttling after with the rifles. When we got to the shepherd—a boy of sixteen—we found him unhurt, as the bear only charged past him, but so confused that he could not tell us which way the bear had gone. We reconnoitred the hillside for a long distance, but in vain, and while scrambling up the slopes in *chaplies* (for my supply of grass-shoes had run out) I slipped and twisted my ankle, and again gave it a second and worse twist when descending. The pain was most acute, and now ibex are out of the question.

After four days in bed I could walk a few steps, so *June 26th* I hired the lambardar's pony to take me up the nullah on khubber of a bear. Foot very tender still, but I can bear the pain if I can also pain the bear! Started at 1 o'clock on the pony, taking the ·500 Express only. After going about two miles up came to a little branch nullah where I pulled up, and sent the pony down to the river to wait for me. I waited till 6, but only a fox turned up about 3 o'clock, barking several times, and then coming down to within sixty yards to inspect me and show himself off—a handsome fellow, with very bushy white-tipped tail, pale rusty face, and creamy yellow fur—his winter coat. As there was no sign of the bear, I rode further up the valley to look for another bear that was supposed to be there. He too was not at home. Turning round at sunset I began to ride homeward. We had gone about a mile, when the village-boy, who was with the pony, pointed to the opposite side of the valley, and ejaculated "Harpat!" I was off the pony in an instant and made the boy sit down and stop gesticulating. There was the bear, about quarter of a mile off. Leaving the pony behind some willows, I told the boy to wait there, and with my glasses I soon made out a second, and then a third bear, and found that it was a family party of mother and two cubs, all coming down to the river to drink. There were trees scattered about, and the wind was the right way, so when the men came up with the rifle, I had no difficulty (bar the lameness) in getting to the river bank unperceived. The old bear suspected nothing, but fed here and there, his silvery grey coat glistening beautifully in the ruddy glow of sunset. Between us was the torrent, the bear about 25 yards away in a thicket. I lay down on the bank behind some shrubs, and waited.

There was a small open space opposite which they would cross to get to the water. On they ramble, the old one leading. She is coming, my own, my sweet: a branch of a pine partly shelters her, so have patience, eager heart; here she is broadside on; bang!

She fell over at once, and I jumped up and gave the left barrel to a youngster, but I could not see whether I hit or not. The old one was still struggling, so I gave her another shot as a quietus. Sending the men across, they had to go up higher to a snow bridge. I went down the bank about 20 yards with Rehman and climbed a lofty pine-tree that gave a view of the opposite thicket, as I thought the other small bear might be about. We climbed alternately, handing the rifle up from one to the other, until a high branch was reached on which I perched myself, and discerned the back of a youngster. Aiming carefully I fired, and turned him over, dead. Looking with the glasses I could then see dry blood on his fur; the former shot had taken effect too. In the hope of the other youngster returning, I waited until it was too dark to see the foresight, when I descended and rode back to camp, my ankle happily none the worse for this little *tamásha*. As I was still too lame to climb I decided to march slowly back from Dirrell. On the way I looked into Loyen Harda nullah for a couple of days. There were plenty of fresh bear pugs, but I saw no bears. However, I got two shots at musk deer, and secured both, two young males.

SHORT NOTES ON THE ODORIFEROUS GRASSES (*ANDROPOGONS*) OF INDIA AND CEYLON, WITH A DESCRIPTION OF A SUPPOSED NEW SPECIES.

By Mrs. J. C. Lisboa.

(*Read at the Society's Meeting on 7th August* 1889.)

There is great uncertainty about the number of odoriferous grasses growing in India, on account of the confusion in which the subject has been involved by various botanists and writers, who, overlooking varieties caused by cultivation or otherwise, have unconsciously multiplied species.

This can only be cleared up by a practical botanist who has travelled all over India and Ceylon, or had before him a collection of plants from these countries. There is no doubt that when he

comes to describe the order *Graminecæ* in his Flora of British India, now in course of being written, Sir J. D. Hooker will, with the materials in hand, throw much light on the subject.

The present contribution is intended as the description of an *Andropogon* which I think is a new one, and does not presume to clear up the obscure points about the scented grasses which may exist in India, for my knowledge of Botany in general is poor and limited to a few tracts of the Bombay Presidency.

Before I describe this *Andropogon* to you, let me briefly mention those that are already more or less known. We find the following growing wild or cultivated in different parts of India and in Ceylon, and yielding aromatic oils and other scented products.

1*st*. *Andropogon Nardus*, Linn.—This is a magnificent looking grass, with leaves glaucous, large and attenuated at the end; the stem six feet high or even more, with a long drooping panicle about two feet or more in length, consisting of numerous panicled branches. According to General Munro, the distinguishing features of this grass are its rufous colour, short spikes, and narrow leaves. This plant, which is said to grow wild in Ceylon, is also met with in certain parts of the Madras Presidency, particularly in the Southern portious near Travancore. It is also cultivated in Ceylon and Singapore, whence considerable quantities of the oil distilled from it finds its way to the European markets, where it is known under the name of Citronelle oil. (See a beautiful drawing by Trimen and Bentley in their work on Medicinal Plants, p. 297.)

2*nd*. *Andropogon Citratus*, DC.—This grass yields the Lemon grass oil, or oil of verbena of commerce. In India it is found in gardens, and appears to occur only in the cultivated state, although it is stated that in Ceylon it may be seen growing wild side by side with the first-mentioned species. The close resemblance it bears to the former would seem, however, to suggest the idea that it is only a cultivated variety of *A. Nardus*.

The specimen on the table, collected in the garden of the Bishop of Damaun, at Colaba, belongs to this plant, which is also shown in plate 280 given by Wallich in his *Plantæ Asiaticæ Rariores*, under the name of *Andropogon Schœnanthus*. *Andropogon Citratus* is known to the natives of India under the name of *Oli-cha* (green tea), and is, in fact, used at times for aromatizing this beverage and flavouring curries. An infusion of the leaves is used as a diaphoretic in febrile cases, and also in flatulent affections. The oil is used

internally for allaying vomiting and gastric irritability in case of cholera. It is also used externally in rheumatism.

The properties and uses of the last-mentioned species, *A. Nardus*, are similar to those of *Andropogon Citratus*.

3*rd*. *Andropogon laniger*, Desf.—(See Fodder Grasses of the Plains of North-Western India, by Duthie, plate 23.) This grass, known as woolly *Andropogon*, grows extensively in the northern coast of Africa, from Egypt to Algiers. It is also found in Arabia and in the north of India. According to Mr. Duthie, it is common on cultivated land in Sind, the Punjab, Rajputana, and parts of the N.-W. Provinces, and it is also recorded from Thibet at an elevation of 11,000 feet. I had only one specimen (now lost) said to be from the Deccan. It is not ascertained whether this grass is distilled for the production of its oil, but its roots are sometimes used like *kaskas* in the manufacture of tatties.

4*th*. *Andropogon versicolor*, Nees.—This grass exists in the more elevated parts of the Central Provinces of Ceylon. Mr. Thwaites says :—"The inflorescence of this species has, when crushed between the fingers, a rather agreeable aromatic odour. The essential oil appears to be situated principally at the base of the spikelets."

5*th*. *Andropogon Schœnanthus*, Linn.; *A. Martini*, Roxb.; *A. Pachnodes*, Trin. (Sp. Graminearum. Vol. III., plate 327); *A. Nardoides*, Nees; *A. Calamus Aromaticus*, Royle (Illst. of Him. Bot., plate 97), a variety with dense inflorescence.

This grass, named Ginger grass by Europeans, is known to natives as *Rosa*, *Rosha*, *Rose*, etc., etc. It is of all the *Andropogons* the best known.* It appears from the *Bombay Gazetteer*, Vol. 12, that in Khandeish people distinguish two varieties, one with bluish, and the other with white inflorescence. This is what the *Gazetteer* says :—"Another important branch of distilling is the preparing of oil from the forest grass known as *Rosha* (*Andropogon Schœnanthus*), which is of two kinds, one with bluish and the other with white flowers. The oil produced from the first is of a green colour, and is called *Sophia*, that from the other is white, and is called *Motia*. The *Motia oil* fetches a higher price than the *Sophia*. Both grasses grow

* In their work above alluded to, Trimen and Bentley say :—"There is still great confusion amongst the species of *Andropogon* affording grass oil." As a proof we may point to the many names which the Rosha grass, as truly stated by them *the best known and widely distributed*, has received from botanists.

freely though not very widely in many open hill-sides in West Khandeish, especially in Akrani."

An intelligent Parsi, who some years ago farmed a field in Khandeish for distilling oil from this *Andropogon*, tells me that there is no such thing as blue or white varieties; that the grass which bears bluish-green and white inflorescence when young becomes red when ripe. This accords with my observation regarding the changes of colour which this *Andropogon* undergoes as it grows in the Deccan and Konkan. When young the hairs of its spikelets give it a peculiar greenish-blue or whitish appearance, but when it grows older the whole of the inflorescence with the bracts, or floral leaves, especially when these are exposed to or dried in the sun, becomes reddish, as anybody can verify this fact on their way to Poona at the end of the rainy season, and from the several specimens laid on the table collected in the Deccan, Thana, and Khandeish. Those of the last place and the two bottles of oil were kindly sent to me by a Government officer. On examination you will find all the Khandeish specimens to be of a reddish-brown colour, and the kind of oil named *Motia* is of a rather clear golden colour, resembling olive oil, and the *Sophia* turbid or reddish, not white, as stated in the *Bombay Gazetteer*. There are also on the table specimens received from Nasik, the inflorescence of which is of a beautiful admixture of bluish-white and reddish colour.

Now the question is, whether the two varieties, blue and white, mentioned in the *Gazetteer*, are coloured red by age. It is probable that the same plant may bear inflorescence bluish-white and red at different stages of its growth, and the colour and density of its oil may vary according to the process of distillation employed, or according to the age at which the plant is cut.

It may also happen that instead of varieties there may be distinct species. Roxburgh, in his *Flora Indica*, describes an aromatic species under the name of *A. Iwarancusa*. Some botanists however think that this description applies partly to *A. laniger* and partly to *A. Schœnanthus*. Others believe that there is in Northern India a grass with white hairs which, though closely allied to *A. Schœnanthus*, is a distinct species.

Flückiger and Hanbury, in describing in their Pharmacographia, p. 662, the uses of grass oil, say:—"Grass oils are much esteemed in India as external applications in rheumatism and other such affections; *Rusa oil* is said to stimulate the growth of hair. Internally

grass oil is sometimes administered as a carminative in colic, and an infusion of the leaves of lemon grass is prescribed as a diaphoretic and stimulant. In Europe and America the oils are used almost exclusively by the soap-makers and perfumers. The foliage of this large odoriferous species of *Andropogon* is used in India for thatching, it is eaten voraciously by cattle, whose flesh and milk become flavoured with its strong aroma.

"But the most remarkable use made of any grass oil is that for adulterating *Attar of Rose* in European Turkey. The oil employed for the purpose is that of *A. Schœnanthus*, Linn., and it is a curious fact that its Hindustani name is closely similar in sound to the word *Rose*. Thus under the designation *Rusa, Rowsah, Rosa, Rose*, or *Roshé*, it is exported in large quantities from Bombay to the ports of Arabia, probably chiefly to Jeddah, whence it is carried to Turkey by the Mahomedan pilgims. In Arabia and Turkey it appears under the name of *Idris Yaghi*, while in the Attar-producing districts of the Balkan it is known, at least to Europeans, as *Geranium oil* or *Palmarosa oil*. Before being mixed with attar the oil is subjected to a certain preparation, which is accomplished by shaking it with water acidulated with lemon-juice, and then exposing it to the sun and air. By this process, recently described by Baur, the oil loses its penetrating after-smell, and acquires a pale straw colour. The optical and chemical differences between grass oil thus refined and of attar of roses are slight, and do not indicate a small admixture of the former. If grass oil is added largely to attar it will prevent its congealing."

Dr. Dymock, in his interesting work, "the Vegetable Materia Medica of Western India," says:—"The annual export of *Roosa oil* from Bombay to the Red Sea ports and Europe exceed 40,000 lbs.; it is much used by the Arabs and Turks as a hair oil. The Bombay dealers know nothing of its being used to adulterate Otto of Roses. In India sandal-wood is used for the purpose." The learned doctor makes no mention of the two varieties of *Roosha grass* and their oils described by the *Gazetteer*.

All the *Andropogons* mentioned hitherto belong, as you will perceive, to the section called *Cymbopogon*. There are, however, two other species also found in India which belong to the section *Gymnopogon*, one of these is *Andropogon muricatus*. This is a tall grass, plentiful in the moist plains of Southern India, particularly Bengal. The ancient rulers of the country appear to have levied an

impost upon its cultivation. This grass is known on this side of India as *Valeru* and *Vala*, and is used in some provinces as a thatching material or as fodder. When young it is eaten by buffaloes. The roots, named *Kaskas*, are used in making the fragrant fans and tatties. It is said that the roots are exported to Europe, where they are employed in perfumery, and they are used in India in cases of fever, in the form of an infusion, &c.

In the Jhang Settlement Report, it is stated that its tough roots are used in making ropes, and also that the brush employed by the weavers for arranging the threads of the web-baskets are made of the stems. In Oudh a perfume called *Itar* is extracted and used medicinally. (See Dymock's "Vegetable Materia Medica" and Duthie's "Fodder Grasses," plate 24.)

All the *Andropogons* mentioned above have been described by various authors, but the following, as far as my knowledge and reading go, has not been described by any; I have therefore named it *A. odoratus*.

It is known to the natives as *Gawat Wedi*. I came across it whilst arranging plants and dissecting spikelets of grasses for Dr. Lisboa.

Description.—Culm erect, 3—5 ft. high, sometimes branching from the lower part, glabrous; nodes long bearded. Leaves lanceolate, córdate at the base, acute or acuminate, with a few long hairs; the lower cauline and radicle leaves long, the upper small, but their sheaths verylong. Ligula small. Spikes numerous, erect, branched, pedicellate (the pedicel of the lower spikes longer), and congested at the end of a long peduncle without a sheathing bract and forming an erect, dense, ovoid panicle. The rachis, pedicel, and the spikes covered with long silky hairs. Spikelets nearly two lines long, of a purple colour, the sessile and the pedicellate nearly similar; outer glume of the sessile spikelet rather thin, many-nerved, somewhat obtuse and covered with long silky hairs, with a pit in some spikelets of the same plant and absent in others; second glume as long as the first or a little longer, but broader, thin, and keeled; third glume thinner and hyaline; fourth glume, smaller or an awn $\frac{1}{2}$—1 inch long, with an hermaphrodite flower at the end of the pedicel. Pedicel of the pedicellate spikelet covered with white hairs, but the spikelet almost free of hairs. Outer glume stiff, with five or more nerves, not prominent, almost obtuse; second glume thinner, with three nerves, somewhat broader, but as long as the first,

third glume hyaline, smaller; fourth glume very small, hyaline or none; no awn; at the top of the pedicel three stamens not well formed and not as large as in the hermaphrodite flower.

This grass is common at Lanowli on the right side of the station in the fields beyond the woods, where it grows along with *Pollinia tristachya*, Thw., *Ischæmum laxum*, R. Brown, *Arondinacea Nepalensis*, Trin., and other annual grasses. The purple-coloured spikes of *A. odoratus* and *Pollinia tristacya* congested at the end of long peduncles form a most elegant and beautiful feature of the scenery of the field towards the end of the rainy season. It is said to be not uncommon at Khardi, Thana. I have found it in the collection received from this district.

From the description and from the specimen laid on the table, you will see that this *Andropogon* belongs to the section *Gymnopogon*, and is different from all other aromatic *Andropogons*, and as I believe it to be a new species, I have called it, as stated above, *A. odoratus*. The leaves and the inflorescence also, when pressed between the fingers, emit an odour altogether different. If you examine the small qnantity of volatile oil, of a beautiful golden yellow colour, which is on the table in a tiny little glass-tube marked *A. odoratus*, and compare it with that of *A. Martini* in another similar tube, also on the table, extracted by Mr Prebble of Messrs. Kemp & Co., you will certainly pronounce that the odour of the new species is soft, sweet, and more agreeable than that of *A. Martini*; and if it be manufactured on a large scale, with great care and by an improved process, if practicable, it may prove superior even to that of *A. nardus* and *A. citratus*.

Chemical analysis could not be undertaken, because the quantity of the oil extracted was too small for the purpose.

CORRESPONDENCE RELATING TO THE PROTECTION OF INSECTIVOROUS BIRDS IN THE INTERESTS OF AGRICULTURE.

BENGAL CHAMBER OF COMMERCE:
Calcutta, 31*st January* 1888.

No. 90 OF 1888.

From S. E. J. CLARKE, Esq.,
Secretary, Bengal Chamber of Commerce.

To Sir E. C. BUCK, Kt., C.S.,
Secretary to the Government of India, Revenue and Agricultural Departments.

SIR, The Committee of the Chamber of Commerce desire me to hand you

copy of a letter, dated 5th January, from Mr. John Rudd Rainey, Zemindar of Khulna, and copy of the *Englishman* of 31st December, containing a report of a lecture delivered by him before the Agricultural and Horticultural Society of India. With reference to these papers I am to say, that a reconsideration of Act XX. of 1887, "An Act for the Protection of Wild Birds and Game," for the more effectual protection in the interests of Agriculture of insectivorous birds would have the support of the Chamber of Commerce.—I have, &c.,

(Signed) S. E. J. CLARKE,
Secretary.

From JNO. RUDD RAINEY, Esq., F.R.G.S.,
Proprietor of Khulna Estate, Rainey Villa, Khulna.

To S. E. J. CLARKE, Esq.,
Secretary to Bengal Chamber of Commerce, Calcutta.

Dated Rainey Villa, Khulna, the 5th January 1888.

SIR,—I have the honor to request that you will be good enough to submit for the consideration of the Bengal Chamber of Commerce the accompanying copy of the address delivered by me at a meeting of the Agri-Horticultural Society on the 29th ultimo, on the "*Effectual* protection of insectivorous birds in the interests of agriculture," and with reference, thereto, I beg to offer the following remarks:—

2. That in this essentially agricultural country, anything calculated to promote agricultural interests in it, will undoubtedly advance the interests of the teeming millions, the tillers of the soil; and as the Bengal Chamber of Commerce have always taken a deep interest in all matters concerning the welfare of the people of this country, and especially interested themselves in the interests of the vast body of agriculturists in times of famine and other calamities, I hope this influential body will support the good cause I am advocating, and make a representation to the Government of India on the subject, in order to move the Supreme Legislature to pass a more liberal measure in the all-important interest of agriculturists.

3. That as the Government, on account of financial embarrassment have imposed taxes which are highly obnoxious to the masses, and notwithstanding the deservedly profound respect universally entertained towards the present head of the Supreme Government, it is straining the loyalty of the subject to the utmost extent, hence anything calculated to increase the agricultural prosperity of this country is also calculated to relieve the Government from this financial pressure.

4. That as His Excellency the Viceroy has always evinced his desire to follow on the lines of the agricultural policy of his distinguished predecessor and late lamented countryman, the Earl of Mayo, we have every confidence that any fitting representation made to him regarding any legislating measure being recast, in order to avert such terrible calamities as famines and the enormous misery resulting therefrom, would not fail to meet with the consideration that this important subject deserves.

5. In conclusion, I have to say that I do not speak on this matter only as a sportsman and naturalist, but also as an extensive landholder in Bengal, whose

practical experience of Agricultural questions extends over a period of more than a quarter of a century.—I have, &c.,

(Signed) JOHN RUDD RAINEY.

(True copy.)
J. E. S. CLARKE,
Secretary.

(True copy.)
G. A. ANDREWS,
Registrar,
Revenue and Agricultural Department.

THE PROTECTION OF INSECTIVOROUS BIRDS.

At a meeting of the Agri-Horticultural Society on Thursday, Mr. Jno. Rudd Rainey, F.R.G.S., delivered an address on the "Effectual protection of insectivorous birds in the interests of agriculture." He said:—As this Society has ever since its foundation, extending over a period of well nigh three score and ten years, been foremost in bringing forward and discussing all subjects likely in any way to promote agricultural interests in this country, as well as advocating such measures as are calculated to prove conducive thereto, hence I venture, as a member of it, to introduce this by no means unimportant subject to their notice with the view of inviting a discussion upon it at this meeting, and persuading the Society to move the Government to pass an enactment for the *effectual* protection of insectivorous birds in the interest of agriculture. I am more especially induced to do so now, as the recent promulgation of a legislative enactment (Act No. XX. of 1887), entitled "An Act for the Protection of Wild Birds and Game," fully recognises the fact that, the destruction of insectivorous birds injuriously affects agriculture, and endeavours to mitigate the evil, but not to any appreciable extent. This, of course, is not sufficient. The utter extermination of insectivorous birds will, no doubt, be thereby prevented, but what is really wanted is something more,—the *effectual* protection from destruction of these useful, nay valuable, birds to agriculturists.

In America, to quote from the "Report of the Commissioner of Agriculture" for 1870, p. 510, "The laws passed in 1859 and 1860 to protect wild game from indiscriminite slaughter, and to prevent the reckless killing of insectivorous birds, gave great satisfaction. Farmers and fruit growers believe in the wisdom of these laws, and are determined they shall not be violated with impunity."

It being now an admitted and well known fact, that insectivorous birds are the best friends of agriculturists, it is therefore altogether unnecessary for me to lay any stress upon this point. But it may be stated that, in India, where insects are so various, numerous, and prolific, the destruction they commit on growing and ripening crops is simply incalculable, so much so that a stipulation is sometimes inserted in agricultural leases to the effect that no reduction of rent on account of destruction of crops by insects will be allowed.

To anticipate any argument that may be advanced regarding certain insects being not only harmless, but absolutely useful to crops, I may here state that I am not unmindful of the fact now well known to Botanists, thanks to Sprengel.

who, towards the end of the past century, enunciated his ideas on the connexion of flowers and insects, that some insects are useful for the fertilisation of flowers, and in a few cases the latter are absolutely indebted to insects for their propagation; the red clover, for instance, would not produce any seed at all if it were not for the good offices of the humble bee, which, being provided with an elongated proboscis, is able to effect an entrance into the flower to extract the nectar, and thus carries with it the pollen, which is inserted in the flower next visited by it. And with reference to this, who amongst us, I ask, has not read the following beautiful lines of Cowper in his "Task, The Garden?"

"Large foliage, overshadowing golden flowers,
Blown on the summit of the apparent fruit.
These have their sexes, and when summer shines
The bee transports the fertilizing meal
From flower to flower, and even the breathing air
Wafts the rich prize to its apparent use."

But while the function of the nectar or honey generated in the flower is doubtless designed by Nature to allure insects, and thereby to insure cross fertilisation, as just pointed out, by far the greater number of species of insects do not subsist simply on this sacharine secretion; they feed on the tender leaves and flowers, and imbibe the very life-blood or sap of the growing plants, as well as devour the seed while yet in its embryotic state, which often, in the case of the rice crop, for instance, causes a partial failure of this food-grain, and contributes to some extent to scarcity and famine. For instance, the *sis poka*, whenever there is cloudy weather, attacks the paddy crops and causes great injury by eating the sis or "ear" of the paddy gram, whence it derives its name. Next the *mau poka* or "honey insect," which devours the seed in its embryotic state, and leaves no grain at all, but only the husk or chaff,—not *cum grano salis*, as I speak from an extensive personal experience; I hope I do not tire your patience, but may be permitted to relate here an amusing illustration of this fact. A late Lieutenant-Governor of Bengal, the versatile Sir Richard Temple, mentioned to me some years ago, on his arrival at Khulna after his inspection of that tract of country in Eastern Bengal, which was then devastated by the cyclone, that the Deputy Magistrate of Bagerhat had informed him, that the reason of the paddy that season being in certain parts of his sub-division all in husk and having no grain, was owing to these insects having, as he expressed it, "drunk up the milk of the seed of the rice crops there:" Sir Richard, of course, was at a loss to understand what was really meant, when I explained to him what I have above shewn.

Perhaps some persons may be inclined to think that the preservation of insectivorous birds would result in the total extermination of all insects, useful and destructive alike, so I may point out that Nature, in her wise provision for the protection of all things created, has happily provided against such a contingency, by supplying to those insects most exposed to danger from birds, forms and colours assimilating to the plants on which they are found, and that they thus obtain some appreciable protection from their enemies of the feathered tribe: the most striking illustrations of insects being in some measure insured against danger by their similarity to plants are of course those of grasshoppers, walking leaf

insects (genus *Phyllium* of Entomologists); and the various members of the curious family *Phasmidæ*, all common to this country.

Now, taking it for granted, that the preservation of insectivorous birds is necessary in the interests of Agriculture,—for the Legislature has even acknowledged this fact—let us proceed to consider whether the measures adopted are adequate for the purpose or not. In order to do so it will be necessary to refer to the speech of the Hon. Mr. Scoble, the Legal Member in Council, when moving for the Bill introduced by him to be considered and passed, as well as to refer to the provisions of the Bill itself.

At a meeting of the Supreme Council, held at Simla on the 20th October last, the Hon. Mr. Scoble said, "a general consensus of opinion was in favour" of the Bill, and that "where objection has been taken, it has been, not to the principle of the Bill, but that it does not go far enough," which clearly demonstrates that, although legislation on the subject was most opportune, it might, in fact, ought to have gone, a good deal further than it actually did. He then went on to say: "We have endeavoured to meet this objection to some extent," and no doubt so, but altogether insufficiently. That the Bill "will also admit of protection being given to insectivorous birds" is no doubt correct, but to so very limited an extent that it certainly will not, as the Hon. Member contended, "sufficiently" protect agricultural interests, "by empowering Municipal and Cantonment authorities to make rules, fixing a close season for any kind of wild birds, and imposing a penalty on the possession or sale of such birds," of course, only within such limits.

The Act *per se* is very simple and brief, containing no more than four sections in all, and the penalties imposed for any breach of the rules framed under its provisions are by no means severe, only small fines being leviable in respect thereof. But such as they are, they would no doubt adequately act as a deterrent, if the limits within which the rules are to have force, were extended to the whole of British India, and not merely confined to the areas of the different Municipalities and Cantonments comprised therein. Within such areas there is little land under cultivation as a rule, and to prevent the destruction of insectivirous birds in them will be of little benefit to agriculturists generally throughout British India.

Again, the Hon. Mr. Scoble in his speech, already adverted to and quoted in some parts, says—

"As this is a tentative measure, we have not thought it desirable to give District Boards the powers conferred by it on Municipal and Cantonment authorities."

But, at least as regards insectivorous birds, why should the Act be considered a *tentative* measure? These birds, it cannot be gainsaid, do a vast deal of good to agriculturists in protecting their crops from the ravages of destructive insects, and while "the rural population are"—to quote the words of the Lieutenant-Governor of the Panjab cited by the Legal Member—"sorry to see them destroyed, the only persons interested in the trade are the exporters, and a few professional netters and snarers employed by them." Are the interests, then, of the vast body of agriculturists in this essentially agricultural country to be sacrificed to this limited and significant class? There can be but one answer to this question, and that, of course, an emphatic negative. It thus behoves the

Government, in the interest of the teeming millions, the tillers of the soil, to extend the provisions of the Act throughout the length and breadth of India.

I hope that what I have here advanced will induce the Society to make a fitting representation to the Government on the subject, in order to move the Supreme Legislature to pass a more liberal measure in the all-important interest of agriculturists.

No. 1014 of 1888.

GENERAL DEPARTMENT;

Bombay Castle, 28th March 1888.

Forwarded to the Director of Land Records and Agriculture for the favour of report.

J. DEC. ATKINS.
Under-Secretary to Government.

No. 807 of 1888.

Poona, 8th May 1888.

Report.

The important point to clear up is, it appears to me, what game birds or birds used for food are insectivorous. I regret I am unable to furnish this information on which I think depends for its utility any opinion that can be given. My own impression is that the birds which are usually *shot* are either graminivorous, such as, I believe, partridge, rock-grouse, quail, or if not graminivorous, as wild duck and snipe, are not purely insectivorous, or at any rate do not make their preservation of much assistance to the agriculturists. What birds are *snared* I do not know. Accurate information on these points would, no doubt, be given by Mr. G. W. Vidal, C.S.

2. It appears, however, that the application of the Act even in municipalities and cantonments only, will do more to check indiscriminate slaughter than is thought by the writer of the paper in the *Englishman*. His remark that the agricultural area within cantonment or municipal limits is trifling, misses the point. The game sold in towns or cantonments is brought from areas far outside the civic limits, in fact, very seldom from within them. Enforcement of the Act will therefore, I think, give some protection to wild birds over an appreciably wide agricultural area.

3. But as regards cantonments especially, the existing provisions are not sufficient. The checking of sale will not stop soldiers, for instance, shooting in the breeding season. This can be stopped best by a system of licenses—not to be granted during close season.

4. Without the information specified in para. 1, I can give no opinion regarding the extension of the power to Local Boards. The conferring of such powers would at least be popular in certain localities, for instance, in parts of Gujarat, where Jain feeling is strong.

5. I am, however, strongly of opinion that no more should be done than the mere prohibition of sale and restriction by license.

J. MUIR MACKENZIE,
Acting Director. Land Records and Agriculture.

No. 1615 of 1888.

GENERAL DEPARTMENT:

Bombay Castle, 16th May 1888.

Forwarded to Mr. G. W. Vidal, C.S., for favour of information upon the points specified in para. 1 of the Memo. No. 807, dated 8th May 1888, from the Director of Land Records and Agriculture.

E. LAWRENCE.
Acting Under-Secretary to Government.

No. 6192.

Poona, 28th September 1888.

In returning the above correspondence, the undersigned has the honour to express his regret for the delay which has occurred in answering the reference made to him.

2. As far as Mr. Vidal's experience goes, no insectivorous birds are snared on this side of India, the preservation of which can confidently be declared to be necessary in the interests of agriculture. Most of the birds which are snared to any considerable extent, leaving purely aquatic birds out of consideration, are graminivorous birds, such as partridges (including the common grey partridge and the painted francolin), peafowl, sand grouse, quails (including the grey quail, the rain quail, the hustard and button-quails, and two or more species of bush quail or dwarf partridge),; bustards and florikins, which are more insectivorous than graminivorous, are also ruthlessly snared wherever they can be found. But these together with the birds above mentioned will all presumably receive partial protection under Act XX. of 1887.

3. If the undersigned may venture to express an opinion on the general question raised in the correspondence, no sufficiently exact knowledge is at present available, (1) as to the particular insects whose destruction is needed, or (2) as to the particular species of birds whose services can be counted on to fulfil the desired object, to make any special action in the matter other than a blind experiment.

4. Mr. Rainey, it will be observed, has not even attempted to name the species of birds whose special preservation in the interests of agriculture he considers necessary, and Mr. Vidal doubts very much if any one living could supply this omission. Great numbers of the birds whose chief *habitat* is found in highly cultivated tracts are graminivorus, as well as insectivorous. As a matter of fact, such birds are not snared in such quantities as to upset the balance of nature, or to have any appreciable effect on agriculture. But assuming that special protection of such birds would reduce the damage done by insect pests, these

birds with their numbers increased, and the supply of insect food proportionately diminished, might prove quite as destructive to the crops as the insects they had exterminated, and it would be difficult to decide on which side the balance of advantage to the cultivators would lie.

5. For instance, the rosy pastor is a well-known destroyer of locusts, and at the same time he is himself a rapacious consumer of millet; should he be specially preserved or specially destroyed?

6. The obvious conclusion in the opinion of the undersigned is that the special protection of such birds in the interests of agriculture would be just as likely, if it had any effect at all, to do harm as good.

G. W. VIDAL,
Collector of Poona.

MEMORANDUM ON AN OUTBREAK OF SURRA FEVER AT THE STABLES OF THE BOMBAY TRAMWAY COMPANY, LIMITED.

BY F. C. RIMINGTON.

ATTACHED hereto is a statement giving particulars of 14 horses belonging to the stud of the Bombay Tramway Company which were attacked with Surra Fever in the months of November and December 1888. In addition to the record of the outbreak supplied in that statement by our Veterinary Surgeon, we think it well to add a few remarks:—

Locality and Description of the Stables.—It will be observed that of the 14 cases of surra, 10 cases have come from the Company's *Parel* Stables. That stable was constructed in 1886, with accommodation for 174 horses, and the actual average number of horses kept there during the two months, when the outbreak prevailed, was 174. The stables are situated on the Parel Road in the northern and most inland quarter of Bombay. They are bounded on the north by an enclosure about 5,000 sq. yards in area, which is used as a vegetable market, and skirted on three sides by lines of brick-built chawls; on the south by an open space reserved for purposes of a proposed new station by the G. I. P. Railway Company; on the east by the Parel Road, on the other side of which are the Victoria Gardens; and on the west by the G. I. P. Railway track, beyond which again for some distance there is open land. About 2,000 ft. from the stables the Flats commence · open, low-lying vacant land which

extends for several miles, and the greater portion of which is under water during the monsoon. For the 2½ years the stable has been in use there has, up to last November, hardly been a single case of fever there. The stables are splendidly ventilated. The drainage is on the surface system and could not, we believe, be better. The stalls and all the stable fittings are kept most scrupulously clean. Bad smells are unknown. The temperature at Parel generally ranges 2° lower than at Colaba, especially at night. The *Colaba Stables* are situated in the Colaba Causeway. To the north is a large piece of *maidan*, belonging to Government, sometimes submerged during the monsoon for a few days at a time; to the south are Goods stations and yards belonging to the two Railway Companies, to the east the Colaba Causeway road, with the sea about 600 feet beyond; to the west, open *maidan* with the sea distant about 1,000 ft. The average number of horses stabled at Colaba during November and December was 574. The drainage of the stable is inferior to that at Parel, being on an underground system. Great care is, however, taken in flushing the drains, and keeping the premises scrupulously clean. The ventilation of the stables is good. Fever has often been prevalent in these stables in October and November, but the number of fatal cases has been few, and the disease has usually disappeared as soon as the "cold weather" set in.

To sum up: the number of horses kept at *Parel* is less than one-third of that kept at *Colaba*; the interior sanitary arrangements at the former are superior to those at the latter; the record of fever cases at the former has up to November last compared most favourably with that at the latter; the temperature at the former averages 2° lower than at the latter. Notwithstanding all these facts to the credit of Parel, 10 horses have been attacked there during the recent outbreak of surra, against 4 horses attacked at Colaba Stables.

Feed and Water Supply.—(*a*) FEED. The Company's horses get from 12 lbs. to 15 lbs. grain per day according to size. The majority of the horses attacked with "surra" fever were horses receiving 15 lbs. grain feed. The feed in question was composed of a mixture of 8 parts; viz., 3 parts gram, 3 parts barley, 1 part koolti (boiled), and 1 part Indian-corn. Their hay feed was 12 lbs. per diem. The hay is grown on black soil in Guzerat. Like all Indian hay it is jungle hay, not raised on drained land. The

grasses we prefer and chiefly employ for hay are Mosi, Daroia, and Zinjva (known in the Deccan as "Sheera"). From August to middle of October, in accordance with our custom for many years past, the horses received from 2 lbs. to 4 lbs. green grass daily, grown in the neighbourhood of Bombay. They also receive daily 1 lb. bran and 1½ oz. salt.

(*b*) WATER. The water used in the stables and everywhere on our lines is all from the Municipal Reservoirs at Vehar and Tulsi; Colaba stable is supplied with Tulsi water, and Parel stable with Vehar water. We had the water used at the latter stable and at the watering stations on the line near there analysed by the Government analyst, Dr. Lyon. The following is his report upon it:—

"*Statement showing the results obtained on examination of four samples of water forwarded December 18th, 1888, by the Superintendent, Parel Stables, Bombay Tramway Co.*

"Samples labelled—

No. 1. Parel Terminus.
No. 2. Parel Stable.
No. 3. Byculla Bridge, N. Side
No. 4. Byculla Bridge, S. Side

	1	2	3	4
Grains per gallon.				
Total Solids	7·70	8·40	6·30	4·20
Chlorine	·91	·91		·84
Parts per million.				
Free Ammonia	·04	·02	·02	·02
Albumenoid Ammonia	·19	·18	·21	·17

"*Sediments.*—In all scanty, chiefly vegetable *débris.* A few "paramonia in No. 1.

"From these results all four appear to be samples of water very "similar in quality to the ordinary Vehar supply of Bombay. "The Albumenoid ammonia results are perhaps very slightly higher "indicating slightly more organic contamination. Were the case "one of an outbreak of fever among human beings, I should say

"that it was very improbable that any connection existed between "the outbreak and the water supply."

Climatic Conditions last Year.—The monsoon last year was an unusually light one, the aggregate rainfall being 59 inches against an average of 75 inches. In September scarcely any rain fell, the total fall registered that month amounting to 3½ inches only. There was no rain in October, and the temperature which throughout the month was unusually high, touched a maximum of 93° in the shade. Early in October portions of the city were visited with a mosquito plague. The innumerable quantity of these insects in the air indicated something unusual in the climatic conditions, or in the condition of the marshes which skirt Bombay. The weather commenced to get cooler in November, and in the middle of December cold N.-E. and N.-W. winds set in and have since continued, the former blowing during the night and the latter during the day.

Breed of the Horses attacked.—The Company had last October a stud of 739 horses; of these 570 were Australians, and 169 horses of Asiatic breeds. Of the 14 horses attacked with "surra" in November and December, 13 were Australians, and 1 was a Persian. The majority were young horses, well bred, and in excellent condition.

The Symptoms and Course of the Disease.—As a rule the presence of the disease was first detected by the horse going off feed, and looking dejected and weak. An eruption of Urticaria was found on the skin in a few cases. On examining the animal the pulse was found high, generally 50° to 60°, the temperature 102° to 104°, and the lungs, usually, and heart sometimes, affected. If a gelding there was often some slight swelling of the sheath. The membrane was invariably a pale yellowish grey colour, and the anus in some cases extremely relaxed. In a few cases, but not in all, a few blood spots were observable on the membrane of the eye. As a rule when treated with fever medicines and antiseptics, the horse quickly improved, the temperature falling to 100°, to 101°, and the appetite returning. The swelling of the sheath did not, however, in any case entirely subside, and the pulse continued high. The horse would remain in this improved condition for a few days, eating well and looking well. A relapse would then set in, the temperature again rising to 103°, to 104°, or occasionally higher, dropsical swell-

ings would appear along the abdomen, and especially between the forelegs. The horse, although feeding well, would now commence to lose condition. In many cases renewed trouble would be observed at the lungs and heart. The majority of the horses attacked exhibited these alternate improvements and relapses, the animals wasting gradually away, until utterly worn out. In two cases, however, death ensued four days after the disease had declared itself. In these cases the affection of the lungs was extremely severe, the horse would hardly feed at all, and the whole appearance of the animal was very distressed. One horse attacked with the disease, a rather coarse-bred Waler, in very fine condition, lost flesh but slightly before death. The specific "surra" microbe was found in the blood of this animal by Mr. Pottinger, A. V. D. The same gentleman examined microscopically the blood of some of the other cases, and was generally successful in finding the microbe, but not invariably so. The results of the *post-mortem* examination are given in the Veterinary record of the cases hereto attached. In all these *post-mortems* the black colour of the blood was a very noticeable feature.

The Treatment adopted.—The system of treatment adopted in the majority of cases was that recommended by Mr. Pottinger, and consisted of ℥ii Hyposulphite of Soda and ʒi Nitrate of Potash given in the drinking water; 30 drops of Carbolic Acid in ℥i Rectified Spirits given three times daily as a draught. We also tried Arsenic, Aconite, and Sulphate of Quinine in large doses. We cannot claim for any of these medicines that they seemed to exercise any control over the disease. Certainly they did not arrest its course. Every horse attacked with "surra" has either died or had to be destroyed. As a precautionary measure we isolated the horses suffering from it.

Preventive Measures adopted.—As soon as we were satisfied that "surra" had appeared amongst our horses, and that the causes producing it seemed in especial force at our Parel stables, we carried out a most careful and thorough examination of the watering and drainage arrangements at that stable. The results of the examination of the water have been given above. The stable drainage was found in good order, no stoppage anywhere; all drains clean and free from smell. A drain in the neighbouring property to the north was, we found, not working well, and we had it attended to. We disinfected the stables throughout on more than

one occasion with phenyle and water, 1 part to 50, sending showers of it through the air in every direction from a manual fire engine, and thoroughly drenching the roof and stable fittings. Carbolic powder was also sprinkled in all the stalls, and sulphur and tar burnt in braziers in the passage ways. We noticed that the majority of the horses attacked had been standing in portions of the stable most exposed to the N.-W. and N.-E. winds, and that it was since those winds had turned cold in the evening and at night that the outbreak of "surra" had occurred. With a view to obtaining thorough ventilation in the hot weather our stables at Parel are very open in their construction, and although the venetians, with which the sides are fitted, are closed at night, it occurred to us that at certain places the horses were more exposed than they should be to the night winds. To provide against this, we effectually protected the horses from all apertures whence these winds could enter and blow upon them, and considerably increased the warmth of the stables at night by the erection of bamboo and matting screens across the principal entrances. We also gave all the horses standing at Parel a light course of antiseptic medicine. For three days each horse had daily ʒii Hyposulphite of Soda and ʒi Nitrate of Potash mixed with his evening grain feed. These preventive measures were carried out the latter part of December. It was during the last week of that month that we set up the screens, &c., which effectually protected the horses at Parel from cold winds. Simultaneously we introduced stringent regulations at Colaba for the complete protection of the horses there, and maintenance of a more even temperature in the stables at night. Since the 1st January we have so far had no fresh case of "surra."

Possible Causes of the Outbreak.—The professional opinion as to the source of "surra" expressed by the Government Veterinary officers, Mr. Burke, Mr. Evans, and Mr. Steel, in their treatises on this disease, is that the parasites which give rise to it enter the horse's system either with his food or his water. In the Company's stables, the water-supply, pronounced a pure and wholesome one by the Government analyst, is the same as has been in use for several years past, and no alteration has been introduced into the character of the grain and hay feed. The drainage of the Parel stable, where two-thirds of the "surra" cases occurred, is exceptionally good, much better than the drainage at Colaba stable. Immediately to the rear of the stables

at Parel there is a depôt for manure. The dung both from Colaba and Parel is transported there. Thence it is daily removed by carts. A portion of it remains there throughout the night, but none of it remains there longer than the morning subsequent to the day of its receipt. At our old stables at Byculla a similar depôt existed, but the manure remained there for three days before removal. At neither stable has the existence of this depôt heretofore been a cause of unhealthiness. The fever record of the Parel stables for the two years of their existence prior to last autumn has been an extremely satisfactory one, very much more favourable than the record at Colaba. We cannot therefore find anything in the feeding of the horses, their watering, or the drainage of their stables, which would account for the outbreak. All these conditions, in so far as they affect the horses' health, have been, to the best of our belief, precisely the same these last four months as during the many past years when "surra" was unknown to us. We therefore seem directed to seek in some special climatic and atmospheric conditions for the explanation of the outbreak. October and November last were notoriously exceptionally unhealthy months in Bombay. Malarial and typhoid fevers were prevalent, and many cases ended fatally. Unusually unhealthy months for human beings, they would appear to have been usually unhealthy for horses also. The outbreak of "surra" fever was not confined to the Company's stables. Several horses attacked with it were sent to the Government Veterinary Hospital, and others to the private Veterinary establishments in the city. Probably, a far larger number died in their owner's stables. Amongst the cases observed we have not heard of a single recovery. Taking all the above facts into consideration, the opinion we have been led to form is that there was some specially unhealthy influence in the atmospheric conditions this last autumn, which predisposed horses to this particular blood-poisoning fever, and that the specific cause which developed the disease into activity in the horses attacked with it was getting chilled from exposure to the cold northerly winds which during the latter half of November and the month of December blew in the evening and at night. This is the conclusion to which we have been led as the result of our own experience of the disease. In support of this opinion we have the following facts:—(1) that the horses attacked were found to have been especially exposed to cold night winds by

their position in the stables, or nature of their work. At Parel stables, where the majority of cases occurred, alterations in the buildings were in progress. The south wall of the stable had been taken down in order to increase the number of stalls in that direction. This open condition of the premises on that side, while it did not expose the horses to any unwholesome wind (the south wind only blowing in the monsoon time, and being a warm one) tended no doubt to increase the draught through the stables from the north, and to lower their temperature at night. (2) That since the time when we introduced measures for protecting the stables from the northerly winds (a period of five weeks), no fresh case of "surra" has occurred. The last case at Parel stables appeared on the 29th December. It was on the 30th of that month that we completed the arrangements for excluding cold winds. (3) That the Parel stables, where nearly three-fourths of the cases occurred, were, until recently, in consequence of their system of construction, more open and considerably colder than the stables at Colaba. (4) That there is nothing ascertainable in the feeding or watering of the horses, differing from the feeding or watering during previous years when "surra" was unknown to us, or which can, in our opinion, in any way account for the outbreak.

In connection with the exposure of the horses to cold winds and our opinion that the chill to the system therefrom resulting was the immediate factor producing activity in the disease, we may mention that out of 8 horses working as "helping" horses on the Byculla Bridge, no less than 3 were attacked with "surra," and of these 2 were attacked upon the same day. Compared with the work most of our horses do, the work of these particular horses was light, and they were in specially good condition and of exceptionally fine physique. These horses are attached as additional horses to help in pulling cars up the inclines on the Bridge. After pulling up a car they return to the little waiting-sheds provided for them at either end of the Bridge, and stand, usually about 5 minutes, until another car approaches. On examining these sheds, we found them a good deal exposed to the north wind. We have now protected them; but it is easy to understand how in the early morning, or between 7 p. m. and 11 p. m. at night, these horses after getting warm at their work would be specially liable to chill when standing waiting in sheds, until recently not very well protected from cold winds.

In the plains of America it has been noticed that in certain thinly populated districts where fever was prevalent, the introduction of railway tracks and the passage of trains has modified the sanitary conditions. The theory in explanation of this fact is that the displacement of air caused by the rapid passage of the train creates a vacuum and consequent draught, and that a rush of fresh air is in this way introduced. In other words, the train produces a sort of artificial wind. The track of the G. I. P. Railway passes immediately behind our Parel premises, distant only 75 feet from the stables. About 2,000 feet further to the north the Flats commence, and are crossed by the trains. In this memorandum we are anxious to enumerate all possible influences which may have shared in the production of the recent outbreak of "surra." It is perhaps worthy of consideration whether the G. I. P. Railway track, which very shortly after leaving the marshy land of the Flats, passes our Parel stables on their N. W. side, does not act as an air-channel from the one to the other. The line of horses standing next to the railway was the line in which the "surra" was by far the most prevalent.

A conjecture has been put forward by some Veterinary authorities in India that there is a connection between "surra" and rats. A parasite has been found in the intestines of rats which is similar to the parasite noticed in the blood of horses suffering from "surra." It is suggested that where rats have access to grain it becomes contaminated with their excreta, and that when used for horses' feed the parasite may in that way be conveyed into the horses' stomachs. In view of this theory we think it right to mention that although the greater portion of our grain is kept in paved godowns, and we do our best to exclude rats, yet we know that both before and after the grain is received by us rats do frequently get at it. But before our grain is used for horses' feed it is carefully cleaned, both by hand and through a machine. We ourselves cannot, from our own observation, favour the rat infection theory. If the source of the disease is due to grain getting mixed with the excreta of rats, why is the appearance of the fever limited to certain seasons, and why should it appear only in certain years? For the past 14 years it has been unknown in our stables, and during those years our stocks of grain and hay have been less well protected from the incursions of rats than they have been the past 12 months.

We have now we think exhausted all we are in a position to state with regard to our own experience of "surra" fever. We submit these few remarks on a veterinary subject as proceeding of course from a non-professional pen, and while we trust to be pardoned any mistakes into which we may in consequence have fallen, we hope that our experience may be of value to those who are making this disease a subject of special study. As a large owner of horses this Company is deeply interested in researches which have for their object the discovery of a remedy for this most fatal form of equine fever.

Bombay, 7th February 1889.

Veterinary Report on 14 Cases of Surra Fever in the Bombay Tramway Company.

Age.	Breed.	Sex.	Date when attacked with Surra.	Treatment pursued.	Died or destroyed.	Results of *Post-mortem*
			1888.			
16	Australian.	Gelding.	Oct. 18	Fever draughts and Sulph. Maguesia and fever balls.	Died 3-11-88.	Lungs found diseased.
11	Do. ...	Mare ...	„ 21	Fever draughts, fever balls. Also 1 oz. Hyposulph. Soda, ½ oz. Pot. Nitras, water, 30 drops Carbolic Acid. (3 times daily in 1 oz. Spts. of Wine), Sulph. Quinine.	Died 4-12-88.	Lungs found diseased; blood impure.
8	Do. ...	Gelding.	„ 31	Fever balls, fever draughts, and alt. balls. Sulph. Quinine.	Died 26-11-88.	Lungs and heart found diseased; blood impure.
11	Do. ...	Do. ...	Nov. 6	Fever draughts, fever balls. Also 1 oz. Hyposulph. Soda, ½ oz. Pot. Nitras, water, 30 drops Carbolic Acid. (3 times daily in 1 oz. Spts. of Wine). Sulph. Quinine.	Died 2-12-88.	Lungs found diseased; blood impure.
8	Do. ...	Do. ...	„ 12	Fever balls (½ dram), Digitalis, fever draughts.	Died 25-11-88.	Lungs found diseased.
11	Do. ...	Mare ...	„ 18	Fever draughts & Aconite.	Died 21-11-88.	Lungs, heart, and kidneys found diseased.
11	Persian ...	Gelding	„ 19	Fever balls and draughts, alt. and ton. balls. Hyposulph. Soda, Pot. Nit., and Carb. Acid as above.	Died 10-1-89.	Lungs found very much diseased; kidneys slight, all other organs all right; all membranes pale.
11	Australian.	Do. ...	Dec. 11	Fever draughts.....	Died 15-12-88.	Lungs found diseased.
11	Do. ...	Do. ...	„ 16	Fever balls and draughts, alt. and ton. balls. Hyposulph. Soda, Pot. Nit., Carb. Acid and 3 grs. Arsenic (twice daily).	Died 14-1-89.	Lungs very much diseased; blood very impure.
9	Do. ...	Mare ...	„ 16	Fever balls, 1 oz Hyposulph. Soda and ½ oz. Pot. Nit., 30 drops Carb. Acid (3 times daily).	Died 4-12-88.	Heart, lungs, and liver found diseased; blood impure.
6	Do. ...	Do. ...	„ 17	Fever and stimulating draughts fever and ton. balls.	Destroyed 16-1-89.	Lungs shrunk and tubercled; stomach and large intestines very much inflamed; liver enlarged and sodden; heart very much diseased; blood impure.
16	Do. ...	Gelding	„ 17	Fever balls, 1 oz. Hyposulph. Soda and ½ ox. Pot. Nit., 30 drops Carb. Acid. (3 times daily).	Destroyed 22-12-88	Lungs, liver, and heart found diseased; blood impure.
12	Do. ...	Mare ...	„ 23	Fever balls and 3 grs. Arsenic (twice daily).	Died 13-1-89.	Lungs very much diseased; liver hard and congested; stomach a little inflamed; muscles all wasted, and blood impure.
8	Do. ...	Gelding.	„ 29	Fever balls and draughts, alt. and ton. balls, Hyposulph. Soda, Pot. Nit., Carb. Acid and 3 grs. Arsenic (twice daily).	Destroyed 16-1-89.	Blood dirty and dark; stomach a little inflamed and large; intestines very much; lungs slightly diseased.

RECORDED INSTANCES OF CHILDREN HAVING BEEN NOURISHED BY WOLVES AND BIRDS OF PREY.

By Jivanji Jamshedji Modi.

(*Read at the Society's Meeting on 7th May* 1889.)

The wolf is, as its very name shows, a ferocious and blood-thirsty animal. The word is the same as the Sanscrit Vrka (*Z.* Veherka Pe and P gúrg and *Lat.* Vulpes), and comes from an old Aryan root, vraçc, (व्रच्छ), to tear off. Though by nature a ferocious animal as implied by the root of the word, it is susceptible of entertaining towards mankind maternal or human feelings. This paper is intended to describe a case of this tender feeling as recorded in India, and to state a few similar cases, as narrated in old classical literature, of wolves and birds of prey.

I was travelling in Northern India in the early part of 1887, and when I was at Agra at the end of March, I was attracted to a place known as the Secundra, which contained a tomb of Mariam, a Christian wife of the great Akbar, who had, in accordance with his views, of tolerating different religions, taken to his harem wives of different nationalities. I went there to see if there was anything specially Christian in the tomb of that queen, as there was something specially Hindoo in the royal chambers of his Hindoo wife at Fatehpur Sikri. Though I saw nothing there specially Christian, I was delighted with my visit to that place, as I saw there a man who was generally known as the wolf-boy. A boy of the Secundra Church Mission Orphanage, which is located there, drew my attention to this man, whose history reminded me of what I had read in classical literature of ferocious and blood-thirsty animals turning at times tender and kind-hearted. I will describe the history of this boy in the words of the Rev. Mr. Lewis, who published a short history of the Secundra Orphanage in 1885. He says of this boy:—"On February 4th, 1867, he was sent to the Superintendent of the Orphanage by the Magistrate of Bulandshahr, with the statement that he had been taken out of a wolf's hole or den. Some natives, it turned out on further enquiry, had been travelling by some unfrequented part of the jungle in the Bulandshahr district and had been surprised to see a small boy, of five or six years of age, walking about on his hands and feet. On drawing near to see this strange sight, they were amazed to see the boy disappear quickly within the interior of a large hole, which, on close inspection, turned out to be

the dwelling-place of some wild beast. Finding that all efforts to unearth the boy were fruitless, and fearing to venture in after him, they set off to report the unusual occurrence to the Magistrate Saheb of Bulandshahr. This gentleman on hearing the story despatched messengers to the spot, with instructions to light a fire at the mouth of the cave, so as to force out the occupant of the hole by means of the smoke. This was done, and on the blinding and choking fumes making their way into the furthest corner of the hole, a fine snarling she-wolf sprang forth with a bound, and after scattering the bystanders in considerable terror, rushed away for safety and dear life. A moment later the boy too came forth, when he fell an easy prey to those intent on securing him. On conveying him to the Magistrate, the boy was found to be speechless, imbecile, and as near an approach to an animal as a human creature can possibly be. Vegetable food was offered to him; but this he refused. And it was only when meat was placed before him that he would eat. Finding it impossible to ever make the boy rational and useful, the Magistrate forwarded him to Secundra, with the request that he might be allowed an asylum there."

This is the short history of the boy as given in the book referred to. Though wanting in the most ordinary intelligence, he seemed to be sensible of many things. He is reported, in the book in question, to be sociable and unselfish, and "always willing to share his numerous gifts with any one caring to have them." Owing to the lateness of age at which he was brought to the Orphanage he could not be taught to speak, though the attempts of the authorities of the Orphanage in other respects have been successful. At the time when I saw him he was asked by a boy of the Orphanage, by means of signs, to walk like a wolf. He did so on his hands and feet. Then he made me some signs which were interpreted to me as a desire to have some money for smoking cheroots, of which I was told he was very fond. At the time when he was first brought to the Orphanage he walked like an animal on his hands and feet, but he was soon taught to walk erect. At first he did not allow clothes to be put on him. He tore and threw them away; however, he was soon brought round to the use of these. His desire for raw meat only as food was gradually subdued for that of vegetables and ordinary cooked food. He is very ugly in appearance. It is supposed that the boy must have come across the path of a she-wolf, and that she, having lost her young ones, treated him with motherly kindness

and care in place of her little ones; or that she must have stolen the boy from the side of his mother, as is very frequently the case in the poor cottages of many villages in the North-Western Provinces, and then instead of devouring him, must have entertained some attachment for him.

The Rev. Mr. Lewis says that the Secundra Orphanage has been the home of two other wolf boys and one wolf girl. My attention was kindly drawn by a friend to the proceedings of 1875 of the Bengal Asiatic Society, before whom a paper was read on a similar subject by the geologist, Mr. V. Ball. This paper contains a short account of one of the two boys referred to, supplied to Mr. Ball by the Rev. Mr. Erhardt, the then Superintendent of the Secundra Orphanage. The account says of one of the boys that "he was brought to us on March 5th, 1872. He was found by Hindus who had gone hunting wolves in the neighbourhood of Mynpuri, had been burnt out of the den, and was brought here with the scars and wounds still on him. In his habits he was a perfect wild animal in every point of view. He drank like a dog, and liked a bone and raw meat better than any thing else. He would never remain with the other boys, but hide away in any dark corner. Clothes he never would wear, but tore them up into fine shreds. He was only a few months among us, as he got fever and gave up eating. We kept him for a time by artificial means, but eventually he died."

Mr. Erhardt says further on: "Neither of the above are new cases however. At the Lucknow mad-house there was an elderly fellow only four years ago, and may be there now, who had been dug out of a wolves' den by a European doctor, when I forget, but it must be a good number of years ago."

Ancient classical literature holds before us several cases of such miraculous escapes of children at the hands of ferocious animals and birds, like the wolf and the eagle. The case of Romulus and Remus is well known to many of us. Amulius, a king of Alba Longa, who had deprived his elder brother, Numitor, of his rightful claim to the throne, being fearful lest the heirs of Numitor might rise against him, caused his son to be murdered and his daughter Silvia to be made a Vestal virgin. Silvia being violated by Mars gave birth to two sons, Romulus and Remus, who together with their mother were ordered to be drowned in a stream of the Tiber, whence they were carried by a she-wolf, who had come there to satiate her thirst, and who feeling an attachment for them, suckled

and nourished them. Their discovery at the wolf-den by Faustulus, the king's shepherd, led to their ultimate return to their grandfather Numitor and to the foundation of Rome.

Tradition has attributed to Zoroaster a miraculous protection at the hand of she-wolves. When a child he was stolen from his house by some evil-minded persons, who predicted a great blow to their evil cause at the hand of the child when it came to age. They took the child to a den of wolves at a time when the ferocious beasts were absent from their home, killed their young ones, and placed the child there, with a view that the wolves on their return, finding their young ones thus killed, might wreak their vengeance upon the child. The wolves on their return seeing what had taken place at first grew furious, but soon after took the deserted child under their protection, until it was discovered and taken home by the mother, who was wandering in search of the child.

Old classical literature gives us other instances where young children were nourished and brought up, not by wolves, but ferocious birds. Firdousi, the *great Homer* of the East, in his well-known Persian epic, the Shah-nameh, says of the father of Rustom, the *great national* hero of Iran, the Hercules of Persia, that he was brought up by a ferocious bird, called Sîmorg, which, according to the *great Persian* historian, Sir John Malcolm, is the same as the bird Rokh, and which according to some authors is the same as the Griffin, and according to others the same as the Phœnix. It was called Sîmorg (*i.e.*, 30 birds), because it was thought to be as strong singly as 30 other large birds combined. According to Firdousi, in the time of king Minocheher, the wife of Sâm, the Persian General, gave birth to a son, whose body was all covered with gray hairs like that of an old man. Just as William II. was surnamed Rufus, from the redness of his hair, just as Pyrrhus was so called from the yellowness of his curls, and just as the family of Julius Cæsar derived its surname of Cæsar from the fact of its founder having a thick curl of hair (*Lat.* caes-ar-ies, *Sans.* केस, kesa), so this child of Sâm was called Zal-i-zar, *i. e.*, golden-haired old man. The great Persian General Sâm disliked this ugly-looking child, and thought that it brought shame and disgrace upon the family, so he sent the child away to the Caucasus to be exposed on Mount Elburz. While there the bird Sîmorg came to prey upon it, but instead of devouring the child, he had compassion on it, and took it to its own

abode and nourished it with drops of blood from other young animals that it killed. The child was nourished by the bird till it grew up to be a boy, and was taken away by the father, who was always labouring under the stings of conscience for his cruelty towards the child.

Firdousi thus describes the interview between the child and the ferocious bird:—

"Chû Sîmorg râ bachê shud gursnê,
Beparvâz bar shud buland az bané
Bebordash damân tâ be Elbourz kûh
Ke bûdash dar ânjâ kanâm-i-garûh
Suyê bachegân bord tâ beshkarand
Bedân nâle-i-zâr-i-û benegarand
Bebakhshûd Yazdân-i-niki dehash
Yaki bûdani dâsht andar bavesh
Khodâvand meheri be simorg dâd
Nekard û bekhurdan as ân bache yâd
Negeh kard Sîmorg ba bachegan
Bar ân khûrd khun az dû dideh chegân
Shegaft în he bar-u fekandand meher
Bemândand khireh badân khûbcheher
Shekari ke nazuktarân bar guzid
Ke bîshîr mehmân hami khun mazîd,"

i. e., "When the young ones of the Sîmorg got hungry, the bird went flying from its nest into the air. It carried it (*i.e.*, the child) rapidly to the Elbourz mountain, where there was the nest of its family. It carried it to its young ones, so that they may devour it, and see the excessive weeping of the child. God the bestower of goodness favoured the child because there was a long life in store for it. God gave tenderness of heart to the Sîmorg and therefore it did not think of devouring the child. Sîmorg and its young ones looked to the child which was shedding tears from both its eyes. It was marvellous that they showed kindness to the child, and were struck with astonishment at the good-featured child. It (Sîmorg) selected for the child delicate and young animals so that the host may taste their blood instead of milk."

Again, the Greek writers also speak of a Persian prince Achæmines being nourished by an eagle. So was Zanymedes, a beautiful boy of Phrygia, nourished by an eagle.

Semiramis, the founder of the Assyrian empire of Ninevah, was

miraculously preserved and fed by doves. Her mother, Derceto, of Ascalon, in Syria, being ashamed of her frailty with a Syrian youth, exposed this infant child in an open place, where she was preserved and nourished by doves till she was discovered by some wandering shepherds, who took her to Simmas, the chief shepherd of the royal herds. It was from this Simmas that she derived her name of Semiramis. Her surpassing beauty first made her the wife of Onnes, one of the king's generals, and then that of the king himself.

MISCELLANEOUS NOTES.

SERICULTURE IN INDIA.

THE following interesting letter has been addressed by Mr. S. Cunliffe Lister, of the Manningham Silk Mills, Bradford, and the Lister Grant, Dehra Dun, to Mr. Wardle, of Leek :—

Bradford, January 2nd, 1889.

I have read with great interest Mr. Munkerji's letter to you, published in the Report of the Silk Association. You are already aware that it was not my intention to have said or done anything with regard to my sericultural experiments in Dehra Dun and the Punjab, until the coming crop had been ascertained; but we have now got an official appointed by the Indian Government, and as time is of importance, I have thought it might be of use if I shortly and roughly sketched out what has already been done, and also what I think might be done to maintain and develope sericulture in India. It is evident that Mr. Munkerji has much to learn when he says "again it is an industry which must necessarily be in the hands of native peasants," &c.; and further says, "and it is *impossible for foreign capitalists, with hired native labour, to succeed in this industry.*" Such then is the opinion of Mr. Munkerji to-day, and such may be said to be the universal opinion, that sericulture is impossible on any other lines than those which have been followed for thousands of years in all silk-producing countries, both in Europe and in Asia; and yet with all this weight of authority against me, backed up by the experience of ages, I am prepared to demonstrate, to show and to prove, beyond all question and doubt, that labour, guided and controlled by capital and knowledge, can produce cheaper and better silk than has hitherto been done by cottage cultivation.

Thus you have the diametrically opposite opinions, and opposite systems: and time and experience can alone show which is right. I have tried both systems, and have paid dearly for my learning, and therefore can speak with some authority; and I am fully persuaded that this great problem is now completely mastered, and that the future of sericulture in India is thereby assured. Nothing, therefore, could give me greater pleasure than that Mr. Munkerji, or any other official should go and see for himself what is being done at Lister's Grant, and examine and test everything relating to the cost and the quality of the silk produced. If his report is, as I believe it will be, satisfactory, then another year I should propose

that the Silk Association should send some one along with a Government official, and should again examine and test everything relating to the cost and quality of the silk produced, and so prepare the way for its being carried out on a much larger scale by British and native capital. The time for the silk crop is close at hand, and, from its commencement in the first or second week in February, only requires from 30 to 40 days to complete it, so that either Mr. M. or some other expert appointed by Government, might easily devote a month to testing the results.

A considerable portion of the mulberry plantations are now in fair bearing, and surround the rearing houses, and we are provided with seed of the first quality, being the produce of Italian and French breeds, reared on the estate, so that there should be and can be no difficulty in testing everything. For this I have patiently worked year after year, and at last the time has come. I have said, give me fulcrum, and I can move the sericultural world. Give me labour sufficiently trained; seed free from disease; plantations of sufficient age; and rearing houses adapted for the purpose (and without this it is all labour in vain); and then there can be no difficulty in obtaining the most positive, accurate, and undeniable result.

There are certain things of great importance that we have already tested and proved. First, that disease, when the worms are properly fed and attended to, is unknown to us; second, that the seed of the Italian and French *Bombyx mori* reared in the Dun, gives just as good cocoons as in Europe, and, so far, does not appear to degenerate. Last year we compared the two, and found that the cocoons raised from our own seed were quite as good as those from imported European seed. We have therefore ceased to import any, and rely altogether upon our own; and, last year, Mr. Farrant, the manager, to whom much of our success is due, in a small experimental way raised four crops of the ordinary polyvoltine Bengal sort without so much as losing a worm. Such have been the results of intelligent and careful cultivation, and I am perfectly satisfied that disease, about which we hear so much, is only another name for ignorance, neglect, dirt and rearing houses altogether unsuited for the purpose.

I am not proposing to write a treatise on sericulture (I must leave that to those who have more time at their disposal); but the whole art and mystery may be expressed and enforced in three or four simple rules. First, sound seed; second, air, space, and cleanliness; third, regular feeding; fourth, suitable rearing houses. And where do you find these conditions in the native cottage? I have never seen anything of the kind; they may exist, but I again say, I have never seen them. Air, space and cleanliness the worms must have, or disease is certain. Then comes regular feeding, and at night, if possible, as we find that the worms are healthier, spin sooner, and make much finer cocoons, with night feeding.

Mr. Bose, Secretary of the Gurdaspur Board, is right, when he says (and he has evidently taken infinite pains): "My own impression is that the prevalence of disease was far more owing to the want of care, the negligence and general ignorance which prevail amongst rearers than anything else." At last, the Government officials are beginning to find out what I have long since discovered, that it is impossible to rear silk-worms in dirt accompanied with neglect. And he says:— "They never care to make the rearing houses airy, and to keep them clean." Under such conditions I am clear sericulture is utterly impossible. Give what

prizes you will, it is all money thrown away. Mr. Dane, Deputy Commissioner, Gurdaspur, says—"The first prize for foreign seed cocoons fell to Lister & Co.," and further on he says—"it seems somewhat absurd" (I should think it does,) "to award over 1,000 rupees' worth of prizes for a total out-turn of silk of such trifling value, *viz.*, Rs. 6,415." And what is more, if they gave every shilling in the Indian Treasury they would not be one bit nearer. All the wealth of India can never make silk-worms thrive in the hands of dirty, careless, ignorant native rearers. I have paid for my learning, as for several years I joined the Government in giving prizes; but I soon saw that it was a perfect waste of time and money. Then it was that I determined to try what could be done by having everything carried out in a proper, business-like manner; and I am now, as I think, on the point of having a great success, after years of trouble and expense.

Just a word with regard to cottage cultivation, and then I have done. Where mulberry trees abound and the climate is suitable, cottage cultivation should be possible, provided the native rearers are supplied with sound seed, and, above all, are taught how to use it. A certain number of intelligent, trained rearers, going from house to house, might soon bring about abundant success; but it is quite useless to offer prizes to men who know nothing of sericulture, and who are totally ignorant of the fundamental fact that silk-worms cannot be reared excepting with sufficient air, space, cleanliness and regular feeding.

A BLACK TIGER.

No authentic record exists of a black tiger having been seen or killed in Bengal so I am informed. Black leopards are well known, especially in the Madras Presidency and in the Straits Settlements, and I have heard of them in Bengal, though I never saw them alive there (except in the Calcutta Zoological Gardens). But before I go hence and am no more seen, I wish to state that I and several others saw a dead black tiger at Chittagong, and from the entries in my diary, which was pretty regularly kept, I know that it was in March 1846. The news was brought into the station that a dead black tiger was lying near the road that leads to Tipperah, distant about two miles from Chittagong. In the early morning we rode out to see it; but several of the party—Sir H. Ricketts, Mr. Fulwar Skipwith, Captain Swatman and Captain Hore—are no longer alive, and I cannot produce any eye-witness to attest my statement, although several friends to whom I have written recollect that they heard something about it at the time.

I remember perfectly well that the body of the animal was lying in the low bush jungle about twenty yards south of the road, and we dismounted to go and look at it. It was a full-sized tiger, and the skin was black or very dark brown, so that the stripes showed rather a darker black in the sunlight, just as the spots are visible on the skin of a black leopard. The tiger had been killed by a poisoned arrow, and had wandered away more than a mile from the place where it was wounded before it lay down to die. By the time that we arrived the carcase was swollen, the flies were buzzing about it, and decomposition had set in, so that those of our party who knew best decided that the skin could not be saved. I was young and inexperienced, but Captain Swatman, who was in charge of the Government elephant kheddas, and Captain Hore (afterwards Lord Ruthven), of the 25th N. I, were well-known sportsmen, and had each of them killed many tigers. No

doubt was expressed about the animal being a black tiger, and I have often mentioned the fact in conversation from time to time. For several weeks before we saw the dead body, the natives had reported that there was a black tiger which infested the range of hills behind the military cantonments at Chittagong. More than once, when the herdsman brought word that it had killed a cow, Captain Swatman sent an elephant and howdah for me, and we beat through the jungle in vain for it. Probably our tactics were bad, as we invariably went right up to the body of the murdered cow, and the tiger sneaked off on hearing the noise of the elephants into the extensive and impenetrable coverts. We did not attach any importance to the native statement that the tiger was black, as we supposed that this was merely an exaggeration. So also, when a report came in through the native police that a man had been killed by a black tiger in a large village about three miles to the south of the hills behind the cantonments, we supposed that the epithet "black" was only a fanciful description of the animal. When, however, we had seen the black skin of the body of the dead tiger, we concluded that the native authorities had not been drawing on their imagination when they used the epithet "black."

I cannot venture to offer any explanation why this tiger's skin was black. It is well known that there is considerable difference of colour in the skins of ordinary tigers. Some skins have almost a light yellow ground, whilst in others the colour approaches to a dark chestnut-red. Some people attribute this variety of colour to the character of the jungle in which the animals have lived, and this has a sort of probability in it; but the age of the tiger may have also something to say to it, and a beast which was of a dark red in its prime may turn to a lighter colour when it grows old. It was my good fortune during the last forty years to see many more tigers, both wild and in captivity, than falls to the lot of most men in Bengal. I can testify that on the churs of the Ganges and Brahmapootra, when shooting during the hot winds in the end of March, through the remains of the brunt grass and charred stalks, that the animals seemed to vanish before our eyes. Many authorities have written that the skin of a man-eating tiger is usually mangy and dull in colour. There were two man-eating tigers caught and sent to the Calutta Zoo., whose skins were in perfect condition and of a rich colour. There was a fine tigress about five years old with a clean and well-marked skin, whose career I had to cut short, as she had taken to preying on the villagers of a place near Dacca; so that these cases were exceptions to a general rule. But I have no doubt that it is quite true that many old and mangy tigers, with decaying teeth and claws, become man-eaters. The reason is simple. A human being is the most facile prey for a tiger. One grip on the slight neck of a woman and all is over. There is no striking with pointed horns, or kicking with sharp hoofs, as the tiger finds when he is killing a deer or a cow. And who shall say whether a healthy young woman is more tender and wholesome food than the flesh of a sickly old cow, half-starved in the jungle?—C. T. Buckland, F.Z.S, in *The Field*.

NOTE ON A TALKING BULBUL.

It is well known that the common, or Madras Bulbul as is called (*Pycnonotus hæmorrhous*), makes a very amusing pet, and is held in high estimation by some of the natives of the country, especially the Mussulmans, for its pugnacious qualities,

great care being bestowed on its training for combative purposes, but it is not as generally known, I doubt if known at all, that its imitative intelligence is on a par with that of the parrot and other "talking" birds. I was not aware myself that these birds could talk, till some years ago I found it out by something of an accident, and having been the possessor of the bird in question, I can speak from personal experience. Some years back, when in one of the northern districts of the Madras Presidency, a Mahomedan assured me that the Bulbul could talk, and informed me that he had had several which could utter various Hindustani phrases, but as I had reared a number of them, and in no instance knew of any that went beyond their whistle, I could not believe him. Anyhow, as he seemed quite confident of what he told me, I determined to give his statement a fair trial, and he having brought me a young bird, a short time afterwards, I straightway put it to school. I could not, however, have been very industrious with my bird pupil, for it never picked up a single sentence of my teaching, but what I failed in a parrot accomplished. Both these birds occupied the same quarters, and whether it was knocked into its "hard-bound brains" by the parrot's continual chattering or not, I cannot say, but it gradually began with "Polly, Polly, Polly, Polly," and eventually could say, "Pretty Polly, pretty dear; twenty guineas for pretty Polly," and other such hackneyed expressions of bird lore, with head bent down; tongue protruding, and wings expanded, antics for which these birds are famous. It would utter sentence after sentence which, though not very distinct, were quite as intelligible as the talk of a parrot and other birds. Like most pets, my poor bird came to an untimely end through the carelessness of the servant, who left the cage door open one night, so that the next morning I found it destroyed by that pest. I had almost said of creation—the rat.

Yercaud, April 1889 A. W. MORRIS, F. Z. S.

THE RED ANT.

By E.H.A.

THE ways of this remarkable insect are not so well known as they deserve to be. Most of us have made its acquaintance at times in the jungles, but these casual introductions have left no desire for closer intimacy. I think, therefore, that a short account of the Red Ant at home, unillustrated by live specimens, may be interesting.

The insect I mean is about half an inch long, and of a light red, or orange-brown, tint. Its scientific name is *Camponotus smaragdinus*, or "the emerald ant," and Kirby says it is remarkable for its green colour. The explanation of this is probably that the first specimen which found its way to Europe was a queen, for she is green and is a handsome and striking insect. We are more concerned with the worker, and may stick to our familiar name. The red ant, then, is not a house ant. It does not enter our dwellings and plunder our stores. Neither is it a ground ant. It makes neither burrows nor hills. It is entirely arboreal, making its nest among green leaves, which it draws together with a material like silk, or cobweb. As to its food, it seems, like most ill-tempered people, to need very little. I have never seen the red ant storing any thing, but they swarm about corrinda bushes during the fruit season, and often enclose the berries in their leaf cells. They do the same with other fruits, and I have seen them in attendance on

aphides. But it would be rash to infer from this that they subsist on nectar and sweets. A friend of mine, and a valued member of this Society, had a tame eagle killed by them, and that it was killed for the table admits of little doubt. I believe they devour young birds and every other living thing that falls in their way and cannot escape. Considering how few trees on the western ghauts are free from them, it seems a wonder that birds can find places to build their nests. From what I have seen I am inclined to think that a good many nests are deserted on account of them. The red ant appears to be as active by night as by day. This is a point in which the various species of ants differ very much from each other. Some never come out of their holes at night, while some regularly retire for a siesta at noon and doubtless some are wholly nocturnal.

But that which distinguishes the red ant from all other ants, and indeed from all other beings, is its temper. The shepherd in NOCTES AMBROSIANÆ says that the wasp is the only one of God's creature which is eternally out of temper; but the shepherd did not know the red ant. Nor did I till lately. I thought I did, and by painful experience too. I had often had reason to notice how they appear to have intimation beforehand of your intention to pass that way. How they run down every branch that stretches across the path, and wait with jaws extended, how they fling themselves on you, or drop from above, and scorning to waste their strength on your hat or clothes, find out the back of your neck, and bury their long sickle-shaped mandibles in your flesh; but I lately discovered that all this was only the A B C of their ferocity. One evening I found that a countless multitude of red ants had collected about two trees close to my tent and were making a thoroughfare of one of the ropes. I thought it best to discourage this, so I got some kerosine oil, the best antidote I know for insect pests of every kind, and dipping a feather into it, began to anoint the rope, thinking in my simplicity that they would not like to cross the oil and would be obliged to find another road, There was a perfect storm of indignation. They rushed together from both sides, and threw themselves on the oiled feather in the spirit of Marcus Curtius. They died of course, but others came on in scores, panting for the same glorious death, and I had to give up my idea of dislodging them by kerosine. I determined then to try tobacco, for I had always supposed that man was the only animal which could endure the smell of that weed. I lighted a cheroot, and steadily blew the smoke where they were thickest. Never in my life have I seen anything like the frenzy of passion which followed the first few puffs. To be attacked by an enemy of which they could not lay hold seemed to be really too much for them. In their rage they laid hold of each other, and as a red ant *never* lets go, they were soon linked together by head, legs, and antennæ into one horrible, red, quivering mass. I left these, and going to another place, offered the end of my cheroot, with about an inch of ash on it. Several seized it instantly. The heat killed them, but others laid hold of their charred limbs, and by their united strength they positively wrenched off the ash which remained hanging from the tent rope, by their jaws, while scores hurried from both sides, with fiendish fury, to help in worrying it. I then presented the hot end. The foremost ant offered battle without a moment's hesitation, and perished with a *fizz*, but another and another followed and I saw plainly that I was beaten again, for the cheroot was going out, while their fury only burned the more

fiercely. I retired, and after taking counsel with the captain of my guard, made a torch of straw and patiently smoked them to death all along the rope. Then I attacked the root of the tree where they were thickest, and left nothing but a black waste. Half an hour later fresh myriads were carrying off the charred remains of their comrades. They took them up the tree towards their nest, whether for food or burial rites I cannot say. It was now getting dark, so I gave up my enterprise; but before going to bed I brought out a lantern and found them calmly passing up and down my tent ropes as before. I had done everything I could short of burning down my tent, and they remained masters of the field.

It may interest members of the Anthropological Society to know that the jungle people in the Canara District eat the red ant. They take down the whole nest, and ponnding ants and larvæ together, make them into curry. The blood, or juice, of the red ant is, as might be expected, intensely acrid, and it is said that the fumes which rise from them as they are being pounded make the eyes of the operator smart, so what the sensation of eating them must be is scarcely thinkable, It must be like a torchlight procession going down one's throat.

MEMORANDA.

By H. Littledale, Baroda.

Malformed Sambur Horn.—I am sending for exhibition at the next meeting of the Society a sambur-horn—or perhaps a pair of horns joined together—that I have picked up in the jungles east of Surat. These horns seem to have dropped naturally from the head. They are the strangest looking pair I have ever seen, and seem different from any yet figured in the Journal.

The Arni or Arna (Wild Buffalo).—The Arna or Wild Buffalo and the Gaur, or Indian Bison, do not inhabit the same jnngles as a rnle, and to the minds of the natives there can be no difference worth considering between them. Hence I ask is the name Arna or Arni the same word as Rani, the Bheel name for the bison being Rana paro or Rani Bhains, that is, Forest Bnffalo? For *Rani* of Mathe*ran*. Then Arni Bhainsa and Rani Bhains would be the same name applied to different animals (*Bos arni* and *Bos gavaeus*). Such instances of confusion are common in Indian nomenclature.

The metathesis *ar* and *ra* is common too. One instance occurs to me: in Kashmir the natives call a tree *darkhaṫ*, whereas the correct form is *darakht* I believe. The derivation of *Arná* from the Skt. *Árrayak* seems less probable than this conjecture.

The Great Indian Flying Squirrel.—I find that this animal is nocturnal in its flights. Last full moon, I was sitting up in the jungle, and one of these squirrels glided from tree to tree near me. It mounted with curious loopings of its body (as some caterpillars climb) from the very foot to the highest spray of a *Kadai* tree, then launched itself in a curving glide towards the next tree, rising a little when about three yards from it, and taking the trunk about three feet from the ground: the length of flight from 60 to 80 feet, I should say.

Bear killed by Tiger.—I was after a bear for some days in May, bnt it was missing from its accnstomed haunts. At last we found it, or rather its claws, and a few bones, in a tiger's cave. It was a big bear, with claws qnite 3 inches outside curve, but the tiger had certainly shikarred it, and eaten every bit of it!

The Wild Dog and the Tiger.—I found that the old story of wild dogs killing tigers existed in the following form in the Surat jungles. We were talking of a pack of eleven wild dogs that had been killing a sambur close by, and I said to my shikarri, "Shoot them if you can." "No," said the Vasava Patel of the village, "these dogs are my gods: they kill tigers for me." I asked him further, and he said that the dogs—a large pack of them—tree a tiger, then two dogs mount guard, and the rest go away hunting; then two more come and relieve guard, and so on, till the tiger dies of hunger in the tree. (It is in Rice's *Indian Game from Quail to Tiger* that a similar account is given, and a still more wonderful yarn of the tiger dying in the tree, afraid to come down because one wild dog had got spiked on a piece of wood below, and months afterwards the two skeletons were found—the tiger's in the tree, and the dog's sticking on the spike at the foot of the tree!)

Carbolized Arsenical Soap.—Instead of putting camphor in arsenical soap, let me recommend that one ounce of pure carbolic acid be added to every pound of the mixture. This carbolised stuff if applied fresh to the lips, &c., of a skin, will prevent all decomposition. This is much better than the old arsenical soap, and I beg to present the suggestion to all shikarries.

PARASITIC TREES.

On the south side of Chakdara, an outlying Dang village, some 20 to 30 miles east of Bardoli, in the Surat District, is to be found a rather curious case of parasitism.

The parasite is a Sterculia urens (*Karaia, Kangdoli*), and the victim is a Schleicheria trijuga (*Kosim*). The Kosim is a large bifurcated tree, old and hollow. A branch on one of these forks was cut off. On the stump of the branch a young *Karaia* established itself, and at the present time has attained about the size of the original branch, with the appearance of being a regular graft. It flowers profusely, and did so when first found three seasons ago. Its present thickness is considerably greater than the head of the thickest headed man, with his *pagri* on. The *pagri* itself is about the diameter of the parasite, which is seated at a height of twelve feet or more.

The Ficus family of course are, without exception, so far as I know them, the lowest of greedy parasites, but though the Sterculia has a suspicious viscid and plastic appearance in its manner of flowing over inconvenient stones, in its throwing out of large knobs, and in covering up wounds, yet it is not often found parasite, at least in the Dangs, and the present instance is perhaps worth recording. It would be interesting to know where the roots are now, how this Sterculia will manage, as its trunk grows inconveniently large; and whether it gets blown down along with the *Kosim*, or succeeds in establishing itself in the ground down the interior of its supporter. The tree is just on the west side of the road, at the point where it begins to descend from the plateau to the river bed.

F. G.

Madras, Rundall's Road, 17th April 1889.

A CORRECTION.

To the Editor of the Journal of the Bombay Natural History Society.

DEAR SIR,—In your Journal No. I., Vol. III., for 1838, you kindly inserted a list of Burmese Butterflies caught by me. As it was not practicable to submit the proof to me, I regret to say that a good many errors crept in, and I should feel much obliged if you could find room to insert the following corrections and additions: —

No. 3. D. aglæa, Cramer, this should be D. melanoides, Moore.
No. 16 E. midamus, Linnæus, should be E. linnæi, Moore.
No. 19. E. subdita, Moore, should be E. binghami, Moore.
No. 42(*a*). M. duryodana, Felder. Beeling.
No. 97. Curetis bulis, Doubleday.
No. 100. Allotinus alkamah, Distant.
No. 101 A unicolor, should be Paragerydus horsfieldi, Moore.
No. 109. Tarucus plinius, Fabricius
No. 121. } Varieties of N. ardates.
No. 122. }
No. 123 N. prominens, Moore
No. 124. N. macrophthalma, Felder.
No. 126 Catochrysops cnejus, Fabricius
No. 133. Megisba malaya, Horsfield.
No. 134 Lycænesthes bengalensis, Moore.
No. 137. Drupadia boisduvalii, Moore.
No. 141. Spindasis syama, Horsfield.
No. 151 Nilasera subfasciata, Moore.
No. 157. Rapala sphinx, Fabricius.
No. 168(*a*). Catopsilia gnoma, Fabricius, Beeling.
No. 172, Terias rubella, Wallace.
No. 175. Terias Hecabeoides, Ménétriés.
No. 186. Pierids soracta. I cannot account for this name occurring in the list; it has never been met with in Burmah to my knowledge.
No. 200 P. onpape, Moore.
No. 252. Suastus swerga, de Nicéville

Hoping the above will not be found too trivial for insertion.

Yours faithfully,

Madras, 17th April 1889. E. Y. WATSON.

PROPOSED ENGLISH NOMENCLATURE FOR INDIAN BUTTERFLIES.

The following letter appeared in the the *Asian* on 11th June 1889:—

SIR,—You publish in in your issue of May 23th a note on a paper read before the Bombay Natural History Society by Mr. A. Newnham, B.C.S., on the abovenamed subject. With due deference to that gentleman, I think he has somewhat underrated the difficulties arising from such a proposal, and has rather exaggerated the benefits that would accrue from its adoption.

But he is wrong, however, in disparaging the use of the "long double-barrelled Latin" names which at present distinguish our Indian butterflies.

From a scientific point of view such a nomenclature, though, no doubt, somewhat "heavy," is a necessity as much in the study of butterflies as in any other branch of Natural History.

At home, where we have only some sixty odd specimens to deal with, it has been easy enough to affix appropriate popular names to the several species, but I would remind Mr. Newnham that the "double-barrelled Latin" names are in no way extinct, and were the original ones. They are, of course, the only ones used by naturalists when discussing the subject. In my opinion it would be a much harder tax on the memory to be able to recall some hundred popular nicknames, than to remember the specimens by their generic and specific names, for the use of the generic name supplies a cue to the specific name.

Mr. Newnham has apparently a prejudice against these long-sounding Latin strains, and has passed them by rather too casually, for he has failed to observe any indications of appearance or habits in them. I select a few out of the many to support my argument.

P. leucocera, Castalius interruptus, Telicota bambusæ, E. undularis, Abisara suffusa, Zizera pigmea, Junonia asterie—all denote either appearance or habits. There are hundreds of others named on the same principle. Many have been named from the locality in which they appear to be frequent, some from the original discoverer, and *others* have been named "poetically and beautifully," and it is precisely these latter which are of little use to the investigator and collector.

Provided poetry and beauty are combined in a name, with some indication of the habits or appearance of the insects, it is all right; but mere nicknames, such as the "Leaf" butterfly or the "Camberwell Beauty," are useless and undesirable. With regard to the former nicknames I shall have something to add later on.

One specimen *Bedamia exclamationis* appears to have been so called from the many ineffectual attempts (accompanied by strong language) to capture it!

Our Indian butterflies possess no doubt as many peculiarities as their English relations, but these peculiarities have yet to be noticed and recorded in the majority of cases before any suitable and expressive names can be permanently chosen. Some of the more well known species have received popular names, either from amateur collectors (? I refer to those who purchase boxes of butterflies to send home or decorate rooms with), or from the soldiers and schoolboys up-country, such as the Rose butterfly, the Leaf, &c., &c. This latter, I believe, is really *Kallima inachis*, but there are several others to be found in India "exactly alike" (except to the eye of an expert), "only a little different," as Pat would say. Does Mr. Newnham propose that all such butterflies should be called "Leaf" butterflies? For, if not, a man would still require to be a naturalist to be able to distinguish them, and, if so, then we should get very puzzled in identifying the exact insect caught unless we saw it, whereas if he uses the scientific name there is at once an end to all doubt as to its identity. I do not see (and should like to see the matter thoroughly investigated) how such an introduction would in any way further the work of naturalists in this country, and it is to them we must look to complete in time a branch of Natural History which receives a very scant attention or interest at the

hands of the general public. The latter would, I have no doubt, learn the names of a few more specimens by the introduction of a popular English nomenclature, but whether they would take any further practical interest in the subject is extremely doubtful. If I have missed any points which Mr. Newnham suggested, I hope he will enlighten me further on the subject, which is one of great interest to all who wish to see the "Indian butterflies" occupying the place which they deserve from their beauty and variety.

W. H. T.

CORRESPONDENCE.

PAPILIO POLYMNESTOR IN BOMBAY.

To the Editor of the Journal of the Natural History Society.

SIR,—At page 37 of Vol. II. of the Journal, Mr. Aitken says the *Papilio polymnestor* is absolutely unknown in Bombay, and he imagines throughout the Konkan It may be interesting to him and others to know that one day this month, a friend and I saw two in the woods of Sivâdî, and within an hour, possibly the same pair in the cemetery. They were a little ragged, but strong in flight and were feeding on the flowers of a large convolvulus.

In a small spot near the quarry we came upon fifty or sixty of the *Danai genutia* resting on the grass and trees, and a sweep of the net at a passing *Ixias* landed one and two of the former.

W. F. MELVIN.

Bombay, 4th March, 1889.

BOOK NOTICES.

The Geographical Distribution of the Family Charadridæ, or the Plovers, Sandpipers, Snipes and their Allies. By HENRY SEEBOHM. Published by H. Tottenham and Co., Strand.

THE name of H. Seebohm is well known as a practical ornithologist of the first rank. A perusal of his works, "Siberia in Europe," and "Siberia in Asia," will show that no one man can push practical work further than he has done, and every ornithologist should read the two works referred to above. Apart from their zoological value they are most interesting reading; but to proceed:

In the Preface he explains difficulties which had to be overcome in the determination of species, and the definition and limitation of genera.

The concluding words of the Preface are (referring to the book):—"It possesses at least the merit of originality and (if the author may be permitted to pass sentence on his own work) it does not quite deserve the critical remarks made once to a writer, 'Your book is both good and new, but the part which is good is not new and that which is new is not good.'"

After the Preface comes a systematic index and diagnoses in Latin, followed by a list of plates, of which there are 21, the plates being limited to those birds, which have previously not been figured, or only figured badly.

The first nine chapters are taken up respectively with dissertations on the Classification of Birds, the Evolution of Birds, the Differentiation of Species, the Glacial Epoch, Migration, the Paradise or the Charadridæ, Zoological Regions, on Subspecific Forms, and the Charadridæ.

Chapter X. commences the body of the work.

The contemplation of Nature is supposed to exercise a soothing influence, they say, on the mind of man, but when the contemplators write books, it is nearly always the case that they are no more sparing of their criticisms of those who happen to differ from them, than are politicians, and Mr. Seebohm is no exception to the rule.

Commencing with the Stone Curlews, the Stone Curlews we meet in India as a resident is separated from the European bird by the trinomial *Odicnemus crepitans indicus*, but there does not appear to be very much difference between the two. He says the Indian Stone Curlew and the European one are connected by a series of intermediate forms. The latter vary in length of wing from 10″ to 9″, the former from 9″ to 8″. In European examples the white patches on the primaries are rarely seen on the bird, whilst in Indian examples they are rarely if ever absent from it. The white on the outer web of the seventh primary is also much greater in Indian than in European examples. *Odicnemus crepitans* doubtless winters in India.

Charadius pluvialis (the European Golden Plover) is not mentioned as an Indian visitor, but the Siberian birds appear to pass through Turkestan on migration, a few remaining to winter in Baluchistan but the greater number probably migrate as far as Africa. The Asiatic bird, *C. fulvus*, may easily be distinguished by its barred tail and great axillaries.

We have the *C. minor* (the Little Ringed Plover) and *C. minor Jerdoni*, (Jerdon's Ringed Plover); it is said to differ from the former in being smaller (wings 3·9 to 4·25 instead of 4·3 to 4·7 in.), in having the edges of the eyelids swollen and protuberant, and in having the basal half of the lower mandible yellow.

Lobivanellus indicus—The Bronze-winged Wattled Lapwing and *L. indicus atronuchalis*, Blyth's Wattled Lapwing, is hard to separate; intermediate forms are frequently met with; the latter may be distinguished from the former by having the *neck ornamented with a white collar*.

The Common Curlew and the Indian form are separated under the names of *Numenius arquatus* and *N. arquatus lineatus*.

N. arquatus.	*N. lineatus.*
Lesser back white, streaked with brown.	Lesser back unspotted white.
Axillaries white, more or less spotted with brown	Axillaries unspotted white.
Margins of scapulars and feathers on the upper back grey.	Margins of scapulars and feathers on the upper back nearly white.
Length of bill 4·5 to 7 inch	Length of bill 5·5 to 8 inch

None of these characters appear to be constant, and intermediate forms are very common.

In a note there is:—"This is no excuse for confounding the two forms together, as Dresser and other ornithologists have done."

Similarly with the Whimbrels, *Numenius phœopas* and *N. phœopus variegatus*.

The Common Whimbrel is not a Curlew, because its crown *is plain brown with a pale mesial streak*. In its eastern form the Oriental Whimbrel is the only Whimbrel in which the *lower back is much paler than the mantle*.

The following is a list of the species mentioned as having occurred in India Proper :—

Œdicnemus crepitans.	European Stone Curlew.
„ *recurvirostris*.	Great Indian Stone Curlew.
Charadius fulvus.	Asiatic Golden Plover.
„ *helveticus*.....	Grey Plover.
„ *minor*.	Little Ringed Plover.
„ *Jerdoni*.	Jerdon's Ringed Plover
„ *placidus*.	Hodgson's Ringed Plover.
„ *Geoffroyi*.....	Greater Sand Plover.
„ *mongolicus*.	Mongolian Sand Plover.
„ *cantianus*.....	Kentish Plover.
Lobivanellus cinereus.	Grey-headed Wattled Lapwing,
„ *indicus*.	Bronze-winged Wattled Lapwing.
„ *indicus atronuchalis*.	Blyth's Wattled Lapwing.
„ *malabaricus*.	Buffon's Wattled Lapwing.
Vanellus cristatus.....	Common Lapwing.
„ *leucurus*.....	White-tailed Lapwing.
„ *ventralis*, ...	Indian Spur-winged Lapwing.
Cursorius gallicus,.....	Cream-colored Courser.
„ *coromandalicus*.....	Indian Courser.
„ *bitorquatus*.	Jerdon's Conrser.
Glareola pratincola	Common Pratincole.
„ *orientalis*.	Oriental Practincole.
„ *lactea*.....	Little Indian Pratincole.
Himantopus melanopterus,.....	Common Stint.
„ *avocetta*.	Common Avocet.
Hæmatopus ostralegus.	European Oyster Catcher.
Ibidorhynchus struthesi.	Ibis-billed Oyster Catcher.
Numenius arquatus lineatus.....	Oriental Curlew.
„ *phœopus variegatus*.....	Oriental Whimbrel.

Amongst the Stints, there is *Tringa subminuta* (Middendorff's Stint); its specific characters are *wing from carpal joint less than four inches*; *legs and toes pale brown*; *outer tail feathers grey*.

Also *Tringa pygmœa* (the Spoon-billed Sandpiper), which is recognized at once hy its *spatulate bill*. The Snipes conclnde the volnme.

Scolopax solitaria (the Himalayan Solitary Snipe) is our Indian form. It has more than 16 tail feathers, whereas *Scolapax major* (the Great Snipe) *has less thau* 16 *tail feathers*, also the *predominant colour of the four outer tail feathers on each side is pure white*, and *the median coverts are broadly tipped with pure white*; the latter does not approach nearer India than North Persia, which it passes through in migration.

E. F. B.

Recent Information about the Great Auk or Garefowl. By SYMINGTON GRIEVE. Blackwood and Sons, Edinburgh.

THIS is a reprint of the Presidential address of the Edinburgh Field Naturalists and Microscopical Society for 1888. It is a brief sketch of the history of the Great Auk and its extermination, with a detailed account of where its remains, such as stuffed specimens, eggs, bones, skeleton, &c., are to be found.

The chief home of this bird used to be Newfoundland and the North American coasts; we need not be surprised at its extermination, as it was a very stupid bird, hatched only a single egg each season, and was good for food. They are described as having been got on boardship by the ton; they were then salted down in barrels like herrings.

The capture of what are believed to have been the last two Great Auks took place on the coast of Iceland, June 1844; its last authentic occurrence in Great Britain was in 1821, when one was captured at St. Kilda.

Various reported occurrences of a later date are then discussed, but there is no sufficient proof for any later record.

We then come to the record of the whereabouts of the Great Auk remains.

The following is a summary of existing remains:—

	Total No. of Birds represented.
Skins	78 or 79
Skeletons more or less complete	21 or 24
Detached bones	841 or 851
Physiological preparations	2 or 3
Eggs	67 or 69

Of these remains, perhaps the eggs are the most interesting; some attention has lately been drawn to them by two having not long ago been sold by auction in London, and having realized enormous prices; one of these was sold in December 1887, and was bought by Mr. Field for £168: another was bought in 1851 for £1, from Williams of London by Mr. H. Holland; Mr. Holland's daughter, Mrs. Wise, into whose possession it passed, sold it in March 1888 by auction, when it was bought by Gardiner, dealer in Natural History wares, for £225.

In England, Lord Lilford has a collection of five eggs, and Mr. Champley of Scarborough has nine.

To show how the prices of these eggs have risen, I will give the prices at which some have changed hands:—1859, £18; 1861, Napoleons 5; 1864, £24, £25 £30, £45; 1882, £110.

The pamphlet is illustrated by two woodcuts of the Great Auk, and its price is half-a-crown.

E. F. B.

PROCEEDINGS.

PROCEEDINGS OF THE MEETING OF 7TH MAY 1889.

The usual monthly meeting of the members of this Society took place on Tuesday, the 7th May 1889, and was largely attended. Dr. G. Maconachie presided.

The following new members were then elected:—H. H. Aga Khan, Mr. E. Y. Watson (Madras), Mr. H. S. Ferguson (Travancore), Mr. R. Gompertz (Madras), Mr. S. J. Stone (Punjab), Lieutenant W. J. Bythell, R. E. (Beluchistan), and Captain A. R. Cole-Hamilton (Secunderabad).

Mr. H. M. Phipson, the Honorary Secretary, then acknowledged the following contributions to the Society's collections:—

CONTRIBUTIONS DURING MARCH AND APRIL.

Contribution.	Description.	Contributor.
295 Bird Skins	From Assam	Mr. J. Monteath, C. S.
1 Snake	Echis carinata	Capt. Aves.
1 Snake	Cylindrophis maculatus	Mr. G. W. Vidal, C. S.
1 Lizard (from Ceylon)	Calotes nigrilabris	Do.
1 Snake	Tropidonotus plumbicolor	Mr. R. Wroughton.
2 Oil paintings of Orchids	By Miss Hall, Poona	Lieut. E. Jervoise, R. N.
1 Tufted Pochard (alive)	Fuligula cristata	Mr. F. Otto.
2 Tortoise Eggs	Testudo elegans	Mr. W. S. Price.
16 Bird Skins	From Quetta	Mr. A. Newnham.
Several Grey Jungle Fowls.	Gallus sonnerati	Col. W. Scott.
Head of Four-horned Antelope.	Tetraceros quadricornis.	Mr. J. C. Anderson.
1 Red Lynx's Skin	Felis caracal	Mr. A. Spittcler.
1 Jungle Cat's Skin	Felis chaus	Do.
1 Engraving of Prof. Pasteur.	.....	Mr. H. C. Parmenides.
1 Sea Gull (alive)	Larus ridibundus	Mr. W. F. Sinclair, C.S.
1 Wild Dog	Canis rutilans	Brig.-Gen. LaTouche.
2 Scaly Ant-Eaters	Manis pentadactylus	Born in the Society's Rooms.
1 Muntjac's Skull	Cervulus aureus	Genl. Pottinger.
1 Monkey (alive)	Macacus radiatus	Mrs. Charrington.
1 Scaly Ant-Eater (alive)	Manis pentadactylus	Mr. W. Holland.
A quantity of Shells and Curiosities.	From the Persian Gulf	Mr. E. Leggett.
1 Muntjac's Head	Cervulus aureus	Mr. Ameerudin Tyabji.
1 Large Tiger-Cat's Skin	Felis viverrina	Mr. H. S. Wise.
1 Monkey's Skull	Macacus silenus	Do.
2 Scaly Ant-Eaters (alive).	Manis pentadactylus	Mr. S. K. Betham.
1 Cat's Skeleton	Articulated	Mr. John Parmonides.
1 Fowl's Skeleton	Do.	Do.
4 Ibex Heads	Capra sibirica	Col. H. E. Ryves.
2 Markhor Heads	Capra megaceros	
2 Barra Singha do	Cervus cashmirianus	
1 Orial do	Ovis cyloceros	
1 Thar do	Capra jemlaicus	
1 Large piece of Flexible Sandstone.	From Rewara	Mr. J. W. Blackwell.
5 Stuffed Birds	From Shanghai	Mr. A. J. M. Inverarity.
2 Snakes		
A number of Snakes	From Godhra	Mr. C. F. G. Lester.
1 Brown Hawk Owl (mounted).	Ninox scutellatus	Rev. D. R. I. Brandon.
1 Indian Screech Owl. (alive).	Strix javanica	Mr. H. K. Cronan.

Contribution.	Description.	Contributor.
Skull of Indian Antelope ..	Female, with horns.....	Major J. H. Yule.
A number of Fish and Reptiles.	From Raipur, C.P	Mr. J. A. Betham.
81 Birds's Skins	From Saugor, C.P	Lieut H. E. Barnes.
1 Monitor	Varanus dracæna	Mr. G. Rayment, A. V. D.
1 Civet Cat	Viverra malaccensis	Mr. Framji Nanabhai Davur.
2 Panther Cubs (alive).....	Felis pardus	Mr. E. H. Millard.
15 Pairs of Horns	Indian and African Antelopes	Brig.-Genl. LaTouche.
Several pairs of Horns	African Antelopes	Capt. H. G. E. Swayne, R. E.
5 Bird Skins	From Poona	Mr. A. Newnham.
1 Malabar Red Squirrel (alive).	Sciurus malabaricus	Mr. P. J. FitzGibbon.
A quantity of Shells. &c....	From Malabar Coast	Mr. Jas. Murray.
1 Jungle Cock's Skin	Gallus sonnerati	Mr. A. F. Pinhey.
1 Crocodile (alive)	Crocodilus palustris	Mr. C. M. Sykes.
A quantity of Reptiles, &c..	From Ahmedabad	Dr. Robb.
1 Picture in Oils	.....	Mr. S. Tytler.
1 Indian Screech Owl (alive).	Strix javanica	Mrs. A. Medcalf.

MINOR CONTRIBUTIONS FROM

Mr. John Griffiths. Mr. Justice Parsons, Mr. F. Otto. Mr. D. Bennett, Mr. Eduljee Davur, Captain Butler, Captain E. Masters, and Mr. Hewett.

CONTRIBUTONS TO THE LIBRARY.

"Wilson American Ornithology." 3 Vols, and "Life of Frank Buckland," from Mr. A. Newnham.

EXHIBITS.

The attention of the members was drawn to the following exhibits :—

1 wild dog's head and 1 large tiger-cat's head, mounted by Mr. Stanley Tytler.

A collection of shells from Perim Island, by Dr. Banks.

A photograph of the Talipot Palm (*Corypha umbraculifera*), now in flower on Malabar Hill, by the Hon. Mr. Justice Parsons.

The following papers were then read :—

"Bird Catching Spiders" (Note by Mr. A. W. Morris.)

"Proposed English Nomenclature for Indian Butterflies." (Note by Mr. A. Newnham, B. S. C.)

"Recorded Instances of Children having been Nourished by Wolves and Birds of Prey," by Mr. Jewanji Jemsetji Modi.

Mr. Modi quoted several somewhat similar cases, and referred to a number of instances, in old classical literature, of children having been nourished by wolves and birds of prey.

Dr. G. A. Maconachie, while proposing a vote of thanks to Mr. Modi for his paper, remarked that there appeared to be undoubted evidence that in some cases children had been suckled by wolves, but that the legendary accounts of birds of prey having acted as foster-parents to human offspring, were interesting only from a literary point of view and could not be relied upon.

H. B. del.

Mintern Bros. Chromo lith. London.

290. HYPOTHYMIS AZUREA, Bodd.
The Black-naped Blue Flycatcher.

ANDROPOGON ODORATUS. (*Sp. Nov.*)

Described by MRS. J. C. LISBOA *in her* "NOTES ON THE ODORIFEROUS GRASSES OF INDIA AND CEYLON."